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KOPPERS
BY-PRODUCT COKE OVENS

The first Koppers by-product coke plant in America was built at Joliet, Ill., in 1908. At that time, approximately FOUR MILLION tons of coal per annum were carbonized in by-product coke ovens. Today, approximately SIXTY MILLION tons of coal per annum are carbonized in by-product ovens.

Koppers ovens in operation today—totalling over six thousand four hundred—have a carbonizing capacity of FORTY-TWO MILLION tons of coal per annum. In other words, SEVENTY-FIVE PER CENT of the increased by-product coking capacity is in Koppers ovens.

The development in the method of manufacturing coke was an economic one—just as logical as the development in the methods of manufacturing iron and steel; and this astounding growth of the Koppers by-product oven was the recognition by the iron and steel industry generally that the Koppers system of by-product coking and by-product recovery was the perfecting of this development to the highest point of efficiency.

OUTSTANDING FEATURES OF THE KOPPERS OVEN ARE:

First: Strong construction—which means long life and low repair costs.

Second: Perfect heat control and distribution—insuring the most flexible operation and the best results in coke quality and quantity of by-products.

Third: Ability to heat ovens either with coke oven gas or with outside gases, such as producer gas, water gas or blast furnace gas—thus releasing all the rich coke oven gas for use elsewhere. This principle is embodied in the Koppers "Combination" Oven.

Fourth: Accessibility of all parts of oven for inspection, thus making it easy to correct any irregularities which might affect operating results.

Fifth: Simplicity of operation—resulting in low labor costs.

Sixth: Ability to make satisfactory blast furnace and foundry coke from the widest range of coals.

THE KOPPERS COMPANY
PITTSBURGH, PA.

DESIGNERS AND BUILDERS OF BY-PRODUCT COKE AND GAS OVEN PLANTS

Vol. LXVIII THE IRON TRADE REVIEW No. 12
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New Tonnage More Diversified

Wider Fractional Resumption of Independent Capacity Signalizes Better Division of Tonnage — Carnegie Steel Co. Nears Lowest Operations in History — More Structural Work Being Closed—Germany Outbids American Producers

SOME reaction from the recent depressed condition of trade in iron and steel continues to be shown by a more diversified volume of new business. The industry is not yet ready however to accept this change as denoting a fundamental reversal of a poor situation. The maintained inaction on prices of the Steel corporation continues to be closely watched by prospective buyers and confidence in the market while somewhat stronger, still is slow to respond. If production all around is no greater, at least, it is more evenly distributed among the independent plants as demonstrated by the lengthening list of fractional resumptions of steelworks and mill capacity. Steel corporation activities still are drooping. Ingot output is close to 40 per cent this week and falling steadily. The Carnegie Steel Co. has 25 blast furnaces in operation which is only one more than the low record point in 1914. More furnaces soon to go out will bring the active list to the lowest number in history.

With the market in its present unsettled stage and business so held in check, a disposition is growing among independent producers to follow more conservative price policies, especially since many recent quotations are said to have been below the cost line. Various mills in the Mahoning valley, Cleveland, and elsewhere have withdrawn so-called minimum quotations the past week. While the steel market is untested in many respects and actually not stronger, 2.00c Pittsburgh on plates, shapes and bars is more representative of the competitive level. Recent low prices on sheets are more infrequent.

Public Work Appears

Government and municipal work is bringing forth some of the largest tonnage requirements at this time. Detroit leads in this respect with 20,000 to 25,000 tons now in the bidding stage of which about 15,000 tons of rails and track material is for the proposed municipal railway system and 8000 tons or more of reinforcing steel for waterworks and sewerage improvements. At Cleveland 700 tons of steel piling has been placed for the foundation work of the new federal reserve bank building, upon which bids for the construction steel, about 7000 tons, now are to be entered. The 7000 tons for the railroad mail terminal at Chicago has been placed.

Other structural undertakings are in larger number and tonnage, after the poor showing in February when a total of only 25,000 tons, or 14 per cent of shop capacity was placed. Some of the largest lettings are 3000 tons for the International Nickel Co. plant at Huntington, W. Va., 3000 tons for gas container at San Francisco and 1300 tons for a River Rouge bridge at Detroit.

Iron Showing More Life

A few buyers here and there are endeavoring to obtain present spot prices on pig iron, for future deliveries. Scattered sales on this basis have resulted though producers as a class are not encouraging such. In a small way, the iron market is more active and prices seem steadier though irregular. Steelmaking iron inquiries at Pittsburgh total 5000 to 10,000 tons.

The composite market average of THE IRON TRADE REVIEW this week is $44.85 against $45.25 last week, $45.53 two weeks ago, $48.81 in February and $51.73 in January.

Tonnage to Germany

German steelmakers have invaded the Cuban market and in recent weeks have taken 4300 tons of rails at prices much below the American figures. Furthermore six-months to one-year credit has been extended the buyers. Germany also sold Argentine 10,000 steel wheels in competition with American and British manufacturers and British mills captured 2000 tons of structural material for Mexico. A sale of 1000 tons of Chinese pig iron was made to a California buyer at $35 ex-ship. Elsewhere American producers are faring better in the export market where new business continues in greater volume. Mexico placed 7000 tons of pipe, Australia 1100 tons of plates, India 2400 tons of rails and Brazil 2000 tons of rails with the Steel corporation.

THE IRON TRADE REVIEW

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Price Balance Essential

LACK of equilibrium in the purchasing power among the producers of various groups of commodities is one of the delicate spots of the present economic situation. The buying ability of any producer is measured by the amount of commodities he may obtain in exchange for his goods. It the value of his products falls without a corresponding drop in the value of other commodities, his purchasing power shrinks in like ratio. The violent and uneven deflation of recent months has dislocated the general price structure and many economists assert that the restoration of values to a more normal relationship is one of the first essentials necessary to healthy business prosperity.

It is interesting to note, in this connection, that the price relationships in two great basic industries, iron and steel and agriculture, are beginning to show signs of a return to normal lines. This is established by a study by THE IRON TRADE REVIEW presented in this week's issue which traces the purchasing power of one ton of pig iron in terms of wool, hogs, cotton and wheat, over a period of 16 years, down to the present time. It is found that a ton of pig iron now commands virtually the normal amount of wheat and hogs, while it will purchase more than the normal amount of cotton and wool. This is due to the abnormal fluctuations witnessed in these markets in recent months.

The decline of farm products from the peak prices reached last year has been more extended than the fall of iron and steel prices. However, the high level for farm products represented a greater gain over 1913 values than did the peak attained by iron and steel products. In other words, farm products were more inflated than iron and steel.

The summit of the increase of five representative farm products in 1920 over 1913 averaged 268 per cent. Five iron and steel products—pig iron, billets, black sheets, steel bars and structural shapes—showed an increase of only 181.8 per cent over the 1913 level at their highest point. As a consequence of this greater rise in farm products a correspondingly greater fall from peak levels is represented by current prices. The average has been 61.1 per cent against a drop of 41 per cent for iron and steel products. March quotations of the five iron and steel products enumerated are 66.8 per cent above 1913 while farm products average less than 45 per cent above the prewar level. Wheat, however, is 80 per cent above its average price in 1913.

Too Much Supervision

IN his final report on the war industries board, Bernard M. Baruch, who was its chairman, urges the "encouragement of permanent intimate combinations or associations of industry under government supervision." The successful direction of industry during the war brought "great public benefits in the way of prices and abundance of goods, resulting from economies in production and distribution," which Mr. Baruch would continue in peace.

Of the first objection that would be lodged against such a plan Mr. Baruch himself takes cognizance when he says: "But as the same power of association that makes for potential benefits may also make for potential injustices, it is recommended that there be created some sort of government agency which shall supervise such associations."

The second objection grows out of the curbing of the first, namely, the creation of another supervisory government agency. There are too many already, and the tendency should be toward fewer rather than more. Still another concession by Mr. Baruch is that adoption of his policy would require a radical change in the present attitude of the government toward large groupings of industry. The federal trade commission now is spending $900,000 annually to keep business competitive, and the department of justice many more thousands in enforcing the Sherman and similar antitrust laws.

Mr. Baruch appears to have mistaken the causes

which made price-fixing and federal supervision of business during the war a success. He does not appreciate that many an objection was stifled and many an unwilling shoulder put to the wheel because the country was in danger. Theoretically, his proposal may hold water; practically it will not. Any movement that requires government supervision for its success, hoists its own danger signal.

Exemption Clause Carries Danger

CURIOSITY has been expressed over the failure of iron and steel makers to show their accustomed interest in the subject of the tariff. Where on previous occasions when the tariff question was up for consideration they flocked to Washington in numbers and lost no opportunity to raise their voices in behalf of protection, the matter of duties at present scarcely is a live conversational topic. Nothing was more conspicuous at the recent tariff hearings in Washington than absence of iron and steel makers.

This lack of an aggressive policy is due to the fact that iron and steel makers neither expect nor desire a high tariff. Practically all that they really need is full protection against dumping of foreign products in this country. It is held essential that there be incorporated in the proposed tariff act a bargaining clause that would admit of arrangements between the United States and foreign countries, whereby American trade would be fostered, and that would permit retaliation in cases where American goods were subjected to discrimination. The producers, generally, however, feel that the question of an adequate tariff can be left to congress with entire confidence. In one direction there is a danger that this attitude of complacency may be carried to a point of direct injury to the industry. Latest information indicates a probability that a clause which was inserted in the Underwood tariff, with damaging results to American manufacturers may be included in the coming tariff measure. This is the clause that exempted duties on all materials for the construction and repair of all kinds of ships, whether governmentally or privately owned. Not only did this provision force American manufacturers to meet these foreign prices, but the prices that resulted exerted a broad influence on the general home market.

This provision has been found less objectionable in the past than it promises to be in the future, due to the fact that the dislocation of normal trade by war operated to suspend the full effect of the clause and also owing to the extent to which maritime activity has grown in this country in recent years. Its reenactment would be particularly objectionable at this time. Manufacturers of all kinds are affected, since shipbuilding and ship repair requirements embrace a wide variety of products. Any prospect that this exemption clause may remain in force calls for the urgent attention of all the lines of industry directly concerned and no time should be lost in presenting the facts to the proper committees of congress.

Another Chapter on Armor Plate

WHEN the first cast of steel was made at the new naval ordnance plant at Charleston, W. Va., several weeks ago, another chapter was added to the history of the armor plate industry in the United States. From the time in 1812 when John Stevens first submitted plans to congress for an armored vessel and continuing until the present, there has been a constant clash of conflicting opinion regarding making armor plate for the government.

It will be remembered that up until now the United States depended upon three privately-owned ordnance plants for its armor plate requirements. In 1887 at the urgent solicitation of congress, the Bethlehem Iron Co., South Bethlehem, Pa., took a contract for 6702 tons of homogeneous armor and designed a plant for an annual output of about 5000 tons. In 1891 Carnegie, Phipps & Co., Ltd., completed its armor plate plant at Homestead, Pa. and began the production of plate for the government. In 1904 the Midvale Steel Co. built a plant, largely for navy orders.

In judging the work of the navy plant it might be well to contrast the conditions obtaining at Charleston and those existing when the privately-owned establishments were built. The latter were erected and equipped in the period between 1887 and 1904, when the price of building materials and machinery was at its lowest ebb. The government plant was built at the time of highest prices in a period of 60 years. Moreover, the three privately-owned plants, although constructed at the request of the government, rarely were given contracts which enabled them to work at regular capacity. This is shown by the fact that one of these companies received an order for only 1142 tons of armor plate in one year and was required to furnish 18,588 tons the succeeding year. At Charleston such spurts of uneven demand probably will be eliminated. Also, it should be remembered that the privately-owned establishments carried on expensive campaigns of experimental work and were compelled to defend their patent rights in almost every court of the country.

But even if the Charleston plant is saved the cost of preliminary experiment, and profits to the greatest possible extent from the experience of Carnegie, Bethlehem and Midvale, its operating efficiency will have to be of the highest order to make plate cheaper than the private plants. In fact, it is doubtful whether the achievement of theoretical perfection would overcome the tremendous handicap imposed by the overhead represented in the excessive investment.

After the new plant has been in operation for sufficient time to warrant comparison, it will be interesting to know how nearly Mr. Daniels came to justifying his oft-repeated boast that the government can make armor plate cheaper than individual manufacturers.

Iron and Steel Prices

CORRECTED TO WEDNESDAY NOON—SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 864 AND 868

Pig Iron

Bessemer, valley	$27.00
Bessemer, Pittsburgh	28.96
Basic valley	25.00
Basic, Pittsburgh	26.96
Basic, Buffalo	27.00 to 29.00
Basic, delivered, eastern Pa.	25.00
Malleable, valley	26.00 to 26.50
Malleable, Pittsburgh	27.96 to 28.46
Malleable, Chicago	26.50 to 28.50
Malleable, Buffalo furnace	27.50 to 29.50
Malleable, del., eastern Pa.	29.90 to 31.24

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del. Phila.	$28.34 to 30.54
No. 1X, Buffalo	30.00 to 31.00
No. 2 foundry, valley	26.00 to 27.00
No. 2 foundry, Pittsburgh	27.96 to 29.96
No. 2 foundry, Buffalo	27.00 to 29.00
No. 2 foundry, Chicago	26.00 to 28.00
No. 2 foundry, Ironton furnace	27.00 to 28.00
No. 2 foundry, Cleveland	27.00 to 28.00
No. 2X, eastern de. Phila.	26.34 to 29.54
No. 2X, eastern N.J.,tidewater	27.32 to 29.54
No. 2X, eastern del. Boston	31.06 to 34.06
No. 2X foundry, Buffalo fur.	28.25 to 30.25
No. 2X, Buffalo del. Boston	33.71 to 34.71
No. 2 foundry del. Phila.	25.34 to 28.54
No. 2 foundry, N.J., tidewater	26.32 to 28.54
No. 2 southern, Birmingham	25.00 to 26.00
No. 2 Southern, Cincinnati	29.50 to 30.50
No. 2 southern, Chicago	31.60 to 33.16
No. 2 southern, Philadelphia	33.66 to 35.16
No. 2 southern, Cleveland	31.50 to 32.00
No. 2 southern, Boston	32.65 to 34.15
No. 2 southern, St. Louis	30.72 to 33.72
No. 2X, Virginia furnace	26.25
No. 2X, Virginia Philadelphia	31.99
No. 2X, Virginia Jersey City	32.54
No. 2X, Virginia Boston	32.83
Gray forge, eastern Pa.	27.00 to 28.75
Gray forge, valley, Pitts.	25.96 to 26.46
Low phos., standard, valley	43.00 to 44.00
Low phos., standard, Phila.	46.32 to 46.82
Low phos., Lebanon furnace	40.00
Charcoal, Superior, base, Chi.	38.50

Silvery Iron
8 per cent base at furnace

Jackson County, Ohio	$43.50
Tennessee, Chicago delivery	43.03
Ohio brands, Chicago	48.82

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 per cent	$53.00
11 per cent	56.30
12 per cent	59.60

Coke

Connellsville furnace	$4.00 to 5.00
Connellsville foundry	5.00 to 6.00
Pocahontas furnace	8.50
Pocahontas foundry	9.00 to 10.00
New River furnace	7.00 to 8.00
New River foundry	8.50 to 10.00
Wise county furnace	6.50 to 8.00
Wise county foundry	6.50 to 8.50

Ferroalloys

Ferromanganese, 80 per cent, delivered, domestic metal	$89.00 to 90.00
Ferromanganese, 80 per cent, English, c.i.f. Atlantic port	$100 nominal
Spiegel, 18 to 22 per cent furnace spot	32.50 to 37.00
Ferrosilicon, 50 per cent, contract delivered	91.00 to 95.00
Ferrotungsten, standard, per pound contained	50.00c to 55.00c
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, per pound contained, maker's plant	16.00c to 16.50c
Imported ferrochrome, 6 to 8 per cent carbon	nominal
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	5.00c to 7.00c
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Semifinished Material

BILLETS AND BLOOMS
(4 x 4-inch)

Open-hearth, Pittsburgh	$38.00 to 40.00
Open-hearth, Youngstown	38.00 to 40.00
Open-hearth, Philadelphia	44.24 to 45.74
Bessemer, Pittsburgh	38.00 to 40.00
Bessemer, Youngstown	38.00 to 40.00
Forging, Pittsburgh	43.50 to 51.00
Forging, Philadelphia	48.24 to 50.74

SHEET BARS

Open-hearth, Pittsburgh	$38.00 to 40.00
Open-hearth, Youngstown	38.00 to 40.00
Bessemer, Pittsburgh	38.00 to 40.00
Bessemer, Youngstown	38.00 to 40.00

SLABS

Pittsburgh and Youngstown	$38.00 to 40.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$52.00 to 57.00
Grooved skelp, Pittsburgh	2.20c to 2.45c
Universal skelp, Pittsburgh	2.30c to 2.55c
Sheared skelp, Pittsburgh	2.40c to 2.65c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.00c to 2.45c
Structural shapes, Phila.	2.35c to2.80c
Structural shapes, New York	2.38c to 2.83c
Structural shapes, Chicago	2.48c to 2.83c
Tank plates, Pittsburgh	2.00c to 2.65c
Tank plates, Chicago	2.38c to 3.03c
Tank plates, Philadelphia	2.35c to 3.00c
Tank plates, New York	2.38c to 3.03c
Bars, soft steel, Pittsburgh	2.00c to 2.35c
Bars, soft steel, Chicago	2.38c to 2.73c
Bars, soft steel, New York	2.38c to 2.73c
Bars, soft steel, Philadelphia	2.35c to 2.70c
Bar iron, common, Phila.	2.45c to 2.70c
Bar iron, common, Chicago	2.65c to 2.68c
Bar iron, common, Cleveland	3.75c to 4.00c
Bar iron, common, New York	2.48c to 2.73c
Bar iron, common, Pittsburgh	2.70c to 3.06c
Hard steel bars, Chicago	2.50c

Rails, Track Material

Standard bessemer rails, mill	$45.00
Standard open-hearth rails, mill	47.00
Relaying rails, light, St. Louis	27.50 to 38.00
Relaying rails, Pittsburgh	40.00 to 43.00
Angle bars, Pittsburgh base	2.45c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mills	2.15c to 2.50c
Spikes, railroad, Pittsburgh	3.30c to 3.65c
Spikes, railroad, Chicago	4.03c
Track bolts, Pittsburgh	4.60c to 5.50c
Track bolts, Chicago	4.98c to 6.38c
Tie plates, Chicago	3.00c to 3.50c

Wire Products
(100 lbs. to jobbers, carloads; retailers, 10c more)

Wire nails, Pittsburgh	$3.00 to 3.25
Plain wire, Pittsburgh	3.00 to 3.25
Galvanized wire, Pittsburgh	3.70 to 3.95
Barbed wire, painted, Pitts.	3.15 to 3.40
Barbed wire, galv., Pitts.	3.85 to 4.10
Polished staples, Pittsburgh	3.15 to 3.40
Galvanized staples, Pitts.	3.85 to 4.10
Coated nails per count keg, Pitts.	2.60 to 2.85

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Chain, Piling, Strip Steel

Chain, 1 in. proof coil, Pitts.	6.75c
Sheet piling base, Pitts.	2.00c to 2.55c

Cold rolled strip steel, hard coils, 1⅛ inches and wider by 0.100-inch and heavier, base per 100 pounds 5.65c to 6.25c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	3.85c to 4.35c
No. 28, bessemer, Pittsburgh	3.85c to 4.35c
No. 28, open-hearth, Chicago	4.38c to 4.73c
No. 28, open-hearth, Phila.	4.20c to 4.70c

TIN MILL BLACK

No. 28, open-hearth, Chicago	3.85c to 4.35c
No. 28, open-hearth, Phila.	3.85c to 4.35c

GALVANIZED

No. 28, open-hearth, Pitts.	5.00c to 5.70c
No. 28, bessemer, Pittsburgh	5.00c to 5.70c
No. 28, open-hearth, Chicago	5.38c to 6.08c
No. 28, open-hearth, Phila.	5.25c to 6.05c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c to 3.55c
No. 10, bessemer, Pittsburgh	3.00c to 3.55c
No. 10, open-hearth, Chicago	3.38c to 3.93c
No. 10, open-hearth, Phila.	3.35c to 3.65c

Tin Plate
(Per 100 lb. box)

Tin plate, coke base, Pittsburgh	$7.00

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers Carloads

	Black	Galv.
⅛ to 3 in., butt steel	57½	44
¼ to 1½ in., butt iron	29½	13½

Full pipe schedule page 868.

Boiler Tubes

Steel, 3½ to 4½ inches, c. l.	40½ off
Iron, 3½ to 4½ inches, c. l.	12 off

Full boiler tube schedule page 868.

Cast Iron Water Pipe
Without War Freight Tax
Class B Pipe

Four-inch, Chicago	69.10
Six-inch and over, Chicago	64.10
Four-inch, New York	73.30
Six-inch and over, New York	63.30
Four-inch, Birmingham	60.00
Six-inch and over, Birmingham	55.00
Three-inch, Birmingham	70.00

Class A pipe is $4 higher than Class B

Hoops, Bands, Shafting

Hoops, Pittsburgh	2.70c to 3.05c
Bands, Pittsburgh	2.70c to 3.05c
Hot rolled strip steel, Pittsburgh stamping quality	2.85c to 3.30c
Cold finished steel bars, Pittsburgh base	3.00c to 3.60c

Rivets

Structural rivets, Pittsburgh	3.70c to 3.75c
Boiler rivets, Pittsburgh	3.80c to 3.85c

Rivets, ⅞ in. and smaller, Pittsburgh 60-10-5 to 62-10 off

Nuts and Bolts
Prices f.o.b. Pittsburgh, Packages of 50

CARRIAGE BOLTS
(½ x 6 inches, smaller and shorter)

Rolled thread	60 off
Cut thread	50-10 off
Larger and longer	50-10 off

MACHINE BOLTS
(½ x 4 inches, hot pressed nuts)

Rolled thread	60-10-10 off
Cut thread	60-10 off
Larger and longer	60 off
Plow bolts Nos. 1, 2 and 3 heads	50-10-5 off
Other style heads	50-10-5+20%
Stove bolts in packages	75-10-10 off
Stove bolts in bulk	75-10-10-2½ off
Cold pressed semifinished hexagon nuts ½ in. and larger	70-10 off
Cold pressed semifinished hexagon nuts ⅜ in. and smaller	80 off
Gimlet and cone point lag screws	65 off

NUTS
(Up to 1¼ and 1½ inches inclusive)

Hot pressed, square blank	$3.25 off
Hot pressed, square tapped	3.00 off
Hot pressed, hexagon blank	3.25 off
Hot pressed, hexagon tapped	3.00 off
Cold pressed, square tapped	2.85 off
Cold pressed, square blank	3.10 off
Cold pressed, hexagon tapped	2.85 off
Cold pressed, hexagon blank	3.10 off

Prices Present and Past

Representative market figures yesterday, one month ago, three months ago and one year ago

Prices given in this table are those ruling on the largest percentage of sales, at the dates named

	Prices Mar. 23, 1921	Average prices Feb., 1921	Dec., 1920	Mar., 1920
PIG IRON—				
Bessemer, valley, del., Pittsburgh	$28.96	$30.96	$36.96	$43.40
Basic, valley, del., Pittsburgh	26.96	28.71	34.96	44.40
*No. 2 Foundry, val. del. Pitts.	27.96	29.96	37.56	43.40
*No. 2 Foundry, Chicago	25.00	28.65	37.00	43.00
Lake Superior charcoal, Chicago	38.50	38.50	51.50	57.50
Malleable, valley	26.00	28.75	36.00	43.75
Malleable, Chicago	25.50	29.15	37.50	43.50
*Southern, No. 2, Birmingham	25.00	27.90	38.00	40.00
*Southern Ohio, No. 2, Ironton	27.00	30.00	37.25	43.25
Basic eastern del. eastern Pa.	25.00	29.95	35.60	43.00
**No. 2X, Virginia furnace	26.25	31.25	40.05	43.25
**No. 2 X, eastern del., Phila.	27.00	31.05	38.75	45.68
Gray forge val., del. Pittsburgh	26.96	29.21	36.56	42.40
Ferromanganese, 80 per cent, del.	90.00	96.85	120.00	172.00
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pitts.	38.00	43.00	47.60	70.00
Sheet bars, open-hearth, Pitts.	38.00	43.00	47.60	72.50
Billets, bessemer, Pittsburgh	38.50	41.00	45.10	65.00
Billets, open-hearth, Pittsburgh	38.50	41.00	45.10	66.25
FINISHED MATERIAL—				
Steel bars, Pittsburgh	2.00	2.15	2.35	3.85
Steel bars, Chicago	2.38	2.52	2.73	3.03

	Prices Mar. 23, 1921	Average prices Feb., 1921	Dec., 1920	Mar., 1920
FINISHED MATERIAL—Continued				
Iron bars, Philadelphia	$2.45	$2.70	$4.05	$4.20
Iron bars, Chicago mill	2.63	2.65	3.45	3.50
Beams, Pittsburgh	2.10	2.30	2.45	3.25
Beams, Philadelphia	2.35	2.65	2.80	4.00
Beams, Chicago	2.48	2.72	2.85	3.63
Tank plates, Pittsburgh	2.00	2.35	2.65	3.75
Tank plates, Chicago	2.38	2.76	3.03	3.38
Tank plates, Philadelphia	2.35	2.70	3.00	4.25
Sheets, blk., No. 28, Pittsburgh	3.85	4.20	4.45	6.00
Sheets, blue anl., No. 10, Pitts.	3.00	3.35	3.65	5.50
Sheets, galv., No. 28, Pitts.	5.00	5.50	5.80	7.25
Wire nails, Pittsburgh	3.00	3.25	3.25	4.00
COKE—				
Connellsville furnace, ovens	4.50	4.85	6.20	6.00
Connellsville foundry, ovens	6.00	6.30	7.20	7.00
OLD MATERIAL—				
Heavy melting steel, Pittsburgh	15.00	15.00	17.20	28.00
Heavy melting steel, eastern Pa.	12.75	14.50	16.70	25.55
Heavy melting steel, Chicago	11.50	15.25	16.30	24.19
No. 1 wrought, eastern Pa.	17.50	20.50	20.90	36.50
No. 1 wrought, Chicago	12.25	15.90	16.60	30.00
Rerolling rails, Chicago	12.50	15.90	16.70	32.62

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

Iron Buyers Show More Interest

Small Sales and Inquiries in Growing Numbers in Different Districts—Some Demand for Future Delivery—Steelmaking Lots Pending at Pittsburgh Total 5,000 to 10,000 Tons—Market Appears Steadier

Philadelphia, March 22.—Plans for blowing out during the next three to four weeks, at least five of the nine merchant furnaces active in eastern Pennsylvania, New Jersey and eastern New York and Virginia are contemplated. This will be due either to the fact the furnaces are nearing the point where their average shipping price will be below cost or because the conversion of raw materials on hand has been nearly completed. A leading sale of the past week involved 1500 tons of basic by a Schuylkill Valley furnace to an eastern plate maker at $25 delivered. Most of the week's business was in foundry iron but the total was comparatively small. Prices done on this business ranged from $25 to $26 base eastern Pennsylvania furnace. A price of $25 base apparently was not shaded. A pipemaker who inquired for 500 tons of iron did not buy. A local soil pipe maker who inquired for 1000 tons recently has revived this inquiry.

Buying Only Car Lots

Chicago, March 22.—While the pig iron market in Chicago is quoted at a range of $25 to $27, furnace, for foundry iron of 1.75 to 2.25 silicon, no one seeks to conceal the fact that a round tonnage undoubtedly would bring out a quotation of $25, furnace, from the most conservative seller. As a matter of fact, iron is available now from some sources at $25, Chicago, in tonnages larger than single carloads. The general average of the market is $26, Chicago, this being the price at which practically all interests are willing to take on business in small and medium lots. In some cases carload orders have been closed recently at $27, furnace. Practically all inquiry is confined to small quantities for current use, mostly. Recent sales are confined almost entirely to single cars or lots of 100 tons or slightly more. Carloads, with occasional 100 to 300 tons being asked.

Present stocks of pig iron are difficult to gage, as the time they will last depends entirely on the rate of operation. Four merchant furnaces are in operation in this district, and some iron is being piled each week, but no plans are on foot now to curtail production further. An inquiry for 100 tons of low phosphorus iron is current. Resale iron of this grade is not now available as previous offerings have been absorbed. The quotation on this grade now appears to be $38, eastern furnace. Southern iron is not moving except in small lots for melters who believe they need it especially for their particular class of work. A recent sale of two carloads was made at $25 base, Birmingham. This iron was of fairly high silicon. A radiator interest recently bought 300 tons of southern iron at $25, Birmingham.

Small Sales Are Numerous

Cleveland, March 22.—Interest in the pig iron market among miscellaneous consumers has continued to show some increase but inquiries and sales with few exceptions are in small lots. The usual unit of trading is from carloads to 100 tons. This development is taken both to indicate some betterment in foundry business and also some reduction of stocks in the yards of consumers. In occasional instances melt-

Composite Market Average

Representing the Combined Average Prices Per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Seven Years Ago

March 23, 1921	March 16, 1921	February, 1921	December, 1920	March, 1920	March, 1914
$44.85	$45.25	$48.81	$53.45	$65.47	$23.60

ers are attempting to buy for future delivery at current spot prices. The largest inquiry current has been from the American Radiator Co., calling for 3000 tons for Buffalo, 750 tons for Detroit and 250 tons for Titusville, Pa., all foundry iron. An Erie, Pa., consumer is inquiring for 100 tons of malleable and 100 tons of foundry iron. Northern Ohio consumers have been placing more orders in a small way, usually on the basis of $26 valley, or $27.96 delivered. Cleveland makers are meeting this price outside the local districts where their quotations remain $27 base furnace or about $27.50 delivered. Buying in the immediate Cleveland district while a little better, is light. One sale outside the district of 500 tons at $26 base, western Pennsylvania furnace, is reported. Reports of lower prices than $26 base, are reported as having been received by some consumers in northern Ohio. In cases these are said to have been as low as $25 base. Other recent sales are known to have been made on higher silicon iron at $25.75 base valley. Shipping instructions from consumers to the furnaces continue to show a small but gradual increase.

Buyers Still Hold Off

Boston, March 21.—The pig iron market in New England has further settled down into a waiting state. Several of the dealers have practically ceased efforts to sell and feel that neither price nor argument would be able to develop much business under the present situation. Sales during the week have been limited to carload lots with an aggregate approximately equal to that of the previous week. Inquiry has somewhat subsided, and there is at present practically no business in sight amounting to more than 200 to 300 tons. A Worcester melter who was in the market recently for from 300 to 500 tons has withdrawn his inquiry at least until after the first of April. Activity among New England foundries is just about holding its own. As time goes on without the expected increase in orders, foundrymen are apt to become somewhat discouraged as to the future and are therefore reluctant to lay in supplies of raw material beyond their current needs. Prices in nearly all districts supplying New England are unaltered as compared with a week ago but the tendency is toward softness, and undoubtedly a definite sizable tonnage would mean unusually low figures. Sales of small tonnages have come to light at $25 base eastern Pennsylvania; at $26 base Buffalo; at $28 base, Virginia, and at $26 base, Alabama. Nominal furnace prices in most cases are above these figures.

Metropolitan Inquiry Improves

New York, March 22.—While buying in pig iron during the past week did not aggregate in excess of 4000 to 5000 tons consumers are showing more interest in the market, and inquiries which came out today total about 2500 tons. Foundries report a slight betterment in orders for castings. Operations at foundries all through this district are at a larger rate proportionately than at eastern blast furnaces, and as a result, a more cheerful feeling prevails. Most of the iron sold in this district during the past week has been Eastern Pennsylvania foundry iron which went at $25.50 to $26, base furnace, in most cases, while one large block went at less than $25.50. The differential on 2.25 to 2.75 silicon at present in some cases is as low as 75 cents, while some furnaces ask only another $1 for the 2.75 to 3.25 silicon grade. Because of the extent to which eastern blast furnaces are idle, it is becoming a little difficult to buy specific brands and their various grades. One maker is able to book orders only for the 2.25 to 2.75 silicon grade. Some Buffalo foundry iron has been sold in this district during the past week at $30, base Buffalo. It is known, however, that foundry iron from that district can be had at $28, base, while consumers, in some instances, claim they could buy Buffalo iron in large tonnages as low as $25, and possibly even lower. Virginia foundry iron now can be had at $25 to $26, base furnace. A tonnage of basic has been sold for shipment into this territory at $25, eastern Pennsylvania furnace. A few export inquiries are current but they are small and are not expected to develop into actual business.

Steelmaking Grades Fairly Active

Pittsburgh, March 22.—Considerable impetus has been given to the pig iron market by the appearance of several inquiries for steelmaking grades. The Allegheny Steel Co., is in the market for 1000 tons each of basic and bessemer; the West Penn Steel Co. for 500 to 1000 tons of basic and the Sharon Steel Hoop Co., for 1000 tons of basic. So far as reported, the American Rolling Mill Co., Middletown, O., has not closed on its recent inquiry of 3000 to 5000 tons. By some the early closing of any or all of these inquiries is doubted since it is believed these consumers are after price reductions having in mind the recent low figures around $23 valley recently made by steelworks furnaces. This price still is available, in some cases through brokers from steelworks furnaces on off-grade basic although the latter are inclined to hold the standard grade for their own use. Merchant producers are quoting $25 and $27, valley respectively on basic and bessemer. One interest reports no sale of bessemer has been made to its knowledge in the last month. Another merchant producer states between 5000 and 6000 tons of bessemer and basic was shipped by it during February, and March shipments so far exceed that total. Malleable is obtainable at $26 valley. Activity in foundry iron is on a somewhat reduced scale as compared with recent weeks. One seller reports several sales at $26, base valley, including three 100-ton lots and one of 150 tons, the latter to a Johnstown, Pa., buyer. An interesting inquiry from a district outside of Pittsburgh, asks for 500 to 1500 tons of No. 2 foundry for third quarter. Producers are refusing to quote so far ahead. While producing interests are not inclined to go under $26, some consumers now seeking foundry iron claim to have quotations of $25, base valley and one or two producers would go that low on sizable tonnages.

Some Inquiries Current

Buffalo, March 22.—Some sizable inquiry for pig iron before makers running in the aggregate to 8000 tons. The biggest inquiry is one for 3000 tons of foundry iron, said to have been put out by the American Radiator Co. which recently took 3000 tons here at $25. Another inquiry is for a tonnage almost as large. Another inquiry for 200 to 300 tons of foundry and another for 200 to 300 tons of malleable are current; sales have been small. Resale iron has been sold on a basis of $27 in limited quantities. One specific instance was a sale of a small tonnage of No. 2X (2.25 to 2.75 silicon) at $28.25. Some resale foundry iron of 2.75 to 3.25 silicon, has been sold at $29.50. That sales are very limited is shown by the fact that one local furnace disposed of only one carload during the past week. This producer is holding to $30 for straight furnace iron. Makers nearby this district continue to sell at $26 base furnace and some Buffalo producers would accept $27 base. One interest which had three out of four furnaces out has now two in blast.

New Buying Slightly Better

Cincinnati, March 22.—With reports of improvement in melt at several points throughout this district, a slight increase in pig iron buying has appeared but consumption generally continues in small volume and little or no future inquiry is current. A few consumers who have been entirely out of the market for a long time are taking small lots to meet immediate requirements resulting from the booking of prompt delivery orders. A general resumption took place today at the plants of the Newport Rolling Mills and the Andrews Steel Co., but the renewed activities did not include the steel mills. Fourteen of the 20 sheet mills were put in operation, but the run is indefinite. Officials say that beyond limited orders upon which resumption is based there is little business in prospect. It is stated no pig iron is being bought. In Hamilton, Middletown, Indianapolis, Columbus, Portsmouth and several other centers like conditions prevail among consuming plants. Short order runs are being made, and consumers are not in the iron market either for spot or future needs. The southern market is weak. Producers generally are holding at $26, base, Birmingham, but some orders which under present conditions are considered worth-while, have been booked at $25.

Southern Ohio iron continues quoted at $27 to $28 furnace base. Some fair sized lots have been closed at the former figure and in cases, they have called for future delivery.

Sells Basic at $25, St. Louis

St. Louis, March 21.—A lot of 500 tons of basic pig iron has been sold by a Chicago furnace to a St. Louis consumer at $25, St. Louis. This is about the lowest heard of to date in this territory, aside from resale. Inquiries are pending for one carload of ferromanganese and one carload of bessemer ferrosilicon. No sales of foundry iron or inquiries are reported. Considerable uncertainty obtains relative to the price of No. 2 southern, (1.75 to 2.25 silicon). Producers are not mentioning a minimum price. In the St. Louis district jobbing foundries are showing more activity. In the Belleville end of the district stove plants still are down. The St. Louis Coke & Chemical Co's. blast furnace continues to make records in initial operations, and is shipping its output. In a recent test, in which coke

from its own ovens made from Illinois coal was used, 490 tons of iron were manufactured with an average consumption of 1673 pounds of coke per ton of pig iron. The Mississippi Valley Iron Co. is operating at about half of capacity, and is shipping about 25 per cent of its output.

Selling Small Lots

Birmingham, Ala., March 21.—Southern furnace companies are selling pig iron in small lots, but the aggregate is not much more than the output which is down to the minimum. Only nine furnaces are in blast in Alabama, and none in Tennessee. Of the nine furnaces but two are on foundry iron and belong to independent companies. A little increase in the carlot business has been shown. Some inquiries have come in for larger tonnages but there is no evidence that they were closed. The sale of about 500 tons to a Louisville sanitary pipe plant is the last lot over 100 tons reported. It is admitted here that on a sizable order a price of $25 for No. 2 foundry (1.75 to 2.25 silicon) could be obtained, though open quotations range between $26.50 to $27.50.

Won't Buy Ore

Two Large Companies Have Sufficient for Year They Say

Cleveland, March 22.—At least two large independent iron and steel companies which have interests in iron ore mines will not come into the open market this year for ore, although it is customary for them to buy a large tonnage, unless a demand of unexpected proportions should develop for iron and steel. The ore which these companies will obtain from their own properties, together with the stocks they have on hand will be sufficient for their purposes until the shipping for 1922 begins, according to their present estimates. Several other companies are said to be in approximately the same situation, and will buy very little ore this year. They have too much ore on stockpiles to show any intrest in the market at this time, though the representatives of iron ore operators have tried to start negotiations.

In the eastern district, the possibility of still lower prices on foreign iron ore still exercises a deterring influence in the market. Later demand for vessel tonnage may make it impossible for the foreign ores to be brought in as cheaply as they can now, and they still cannot compete with Lake Superior ores in the Pittsburgh or Youngstown districts. Some mine operators in the Lake Superior district are calling attention to the possibility of ore buying being deferred so long this year that it will throw a burden on transportation facilities at the close of the season and possibly make it difficult to deliver all the tonnage needed. These same operators, however, estimate the total movement this year will not greatly exceed 40,000,000 tons. Prices of iron ore have not yet been determined, and lake vessel rates have not been established.

A supplemental bill will be filed by the Lake Superior operators with the interstate commerce commission so as to include the recent Michigan railroad freight advances within the scope of the case they instituted to have the upper lake freight reduced.

Coke Sales Still Small

Slight Reduction Noted in Foundry Demand, while Furnaces Still Remain Aloof—Price Differences Prevent Closing of Inquiry

Pittsburgh, March 22.—Sellers of beehive coke in this district claim the present market is duller than at any time in recent weeks. There practically is no demand for furnace coke, and requests for foundry coke are slightly reduced. Some of the foundries making castings for automotive use are active, but their coke requirements are limited. Due to the sustained activity among blast furnaces, furnace coke is not being asked for in the spot market, and contracts for it still are suspended, except in one or two cases. Coupled with this situation is the disinclination to book further contracts. So far as reported, practically no contracting is being done in either grade. Some producers, however, whose ovens are not operating at present have turned down some tentative propositions for future shipments. One of these calls for 5000 tons of furnace coke monthly during the second quarter at a suggested price of $5, ovens. Another consumer asked for 10,000 tons monthly, stating that it does not know how long it will operate. The indefinite character of this inquiry made it unattractive. An inquiry for foundry coke now being negotiated is for second quarter delivery, involving 1500 tons monthly. One producer has put on a few additional ovens for foundry coke and has been endeavoring to sell several carloads of first-drawn coke as a price below $4, ovens. Selected foundry coke is being sold at $5.25 to $5.50, although some grades are bringing $6, ovens. Production according to the *Connellsville Courier* for the week ended March 12 was 108,890 tons, as compared with 116,330 tons, the preceding week.

Boston Market Listless

Boston, March 22.—The coke market continues without perceptible change. The rate of consumption of foundry coke in New England, based on figures of producers, is approximately 25 per cent of what it was a year ago. Stocks of coke carried in reserve are excedingly low, probably not over one month's supply at the present rate of consumption. Prices of by-product coke nominally remain firm at the figures established some time ago. The New England Coal & Coke Co. anounces a rate of $12.66 prevailing on all small contracts and spot sales. Large tonnage is able to command better figures and the general tendency in prices is downward. Some soft spots in the market during the week have developed at lower figures than heretofore reported this year.

Inquiry Improves

New York, March 22.—Demand for coke during the past week has been smaller than usual, but inquiry today showed an improvement, including single lots of 2000, 1000 and 500 tons. Prices are unchanged from a week ago and the market on beehive foundry coke for prompt shipment continues to be quoted at $5.50 to $7.50, Connellsville, according to the brand, although it is difficult to do lower than $5.75 where the brand is named. The large export inquiry mentioned a week ago has not resulted in any business.

Extreme Dullness Prevails

Cincinnati, March 22.—Another buying slump is noted in the Cincinnati coke market, with the result that extreme dullness prevails. A few inquiries are out, but some that were up for consideration a week or so ago appear to have been withdrawn. A few foundries which have been taking small tonnages for prompt delivery increased their requirements slightly, while others have cut down. A few releases are being received on suspended shipments. Current price schedules are purely nominal, as sales are made at wider ranges.

"Dullest Period" Reached

St. Louis, March 21.—The past week or ten days, according to selling agencies and producers, constitute the dullest period experienced since the present slump in business set in. Sales have been insignificant and contract tonnages have been delivered, so that the market is dormant. Prices are lower, 72-hour standard Connellsville coke being quoted from $5.75 to $6.25, and the furnace product at from $4.50 to $4.75. These figures are not generally believed to represent the bottom. Foundries and smelters are closing down. The leading by-product manufacturer is operating nearly at capacity, this policy being forced on it by the fact that it produces gas which is sold for consumption in St. Louis.

Mexico Inquiry

Birmingham, Ala., March 21.—No improvement is noted in the coke market in the southern territory and no effort is made to increase the output. Some attention is attracted by an inquiry from Mexico for 1500 tons. Hope is entertained that considerable business will develop from that country. Quotations for by-product foundry coke range between $7.50 and $8.50, and $1 per ton less for furnace coke. The demand for the latter is very light. Foundries and machine shops are buying their coke in carlots just as they are pig iron and producers are receiving many orders, although the aggregate is not large.

Chicago Rate Still Low

Chicago, March 22.—Little change has been made in the rate of operation of steel plants in the Chicago district. The Illinois Steel Co. is running at practically the same rate as last week, or about 45 per cent of capacity. The Inland Steel Co. is operating at approximately the same rate as last week, although it has increased its sheet mill capacity slightly, having 12 mills active this week, as against 10 last week. It is operating seven open-hearth furnaces, its plate and structural mills, giving a rate of about 40 per cent of the available capacity.

Bar Buyers Indifferent

Slightly Increased Demand for Steel Bars Enables Mahoning Valley Mills To Resume—Effort Made To Restore Higher Levels

Chicago, March 22.—Inquiry for soft steel bars has shown no improvement and producers have comparatively little on their books. In fact, while other departments of some mills are operating at a fairly brisk rate, bar mills are largely idle. With the Illinois Steel Co. holding steady at 2.35c, Pittsburgh, the industrial board price, the Inland Steel Co. will take tonnages for prompt or deferred delivery at 2.38c, Chicago mill. Neither price is an inducement to buyers. Producers of bar iron find users entirely apathetic, and one important mill did not book a single tonnage during the past week, a condition without parallel.

Production of bar iron in this district is practically at zero, with all producers idle most of the time. The nominal quotation is 2.68c, Chicago mill. Some makers admit that an inquiry for any reasonable tonnage would bring a lower figure, but in the present untested state of the market no one knows what this might be.

No activity has been evident in hard steel bars for several weeks, with all mills near Chicago idle. A nominal quotation of 2.50c, is maintained, but it is understood a small mill in the West is quoting 2.25c, mill.

No Improvement Shown

New York, March 22.—Steel bar demand so far has registered no improvement in this district. Demand is chiefly in occasional small tonnages, the prices on which vary, as a rule, from 2.00c to 2.10c, base, Pitsburgh. One mill had a tonnage of steel bars on hand which it desired to liquidate and sold it at 1.95c, base, Pittsburgh. The minimum quotation on bars to be rolled, however, still is 2.00c, base, Pittsburgh.

A leading eastern independent has reduced its price on iron bars to 2.10c, Pittsburgh. This follows similar action recently taken by one or two other sellers. These concessions, however, have not as yet resulted in any marked increase in business, the market continuing exceedingly dull.

Selling Small Tonnages Only

Philadelphia, March 22.—Demand for steel bars in this district is limited to small tonnages, and there is no prospect of an early revival. Current business is going at 2.00c to 2.10c, base, Pittsburgh.

Small Tonnages Released

Pittsburgh, March 22.—Makers of cold finished steel bars report but slgiht improvement, with only small lots being involved both in new sales and releases on suspended tonnage. Some of this continues to come from the automotive industry, but so far this merely indicates a trend toward betterment as no large tonnages are represented. On a recent inquiry for a carload of various sizes, one local maker was told that it would take a price lower than 3.25c. now more commonly quoted, to take the business, and 3.00c is reported from time to time, against the 3.60c, base, Pittsburgh, price maintained by the American Steel & Wire Co. While the agricultural implement makers are asking for a little cold-finished steel, practically nothing is being heard from the screw products industries, most of which were loaded up with large inventories.

Mill Operations Resumed

Youngstown, O., March 22.—Demand for merchant steel bars in this territory is reflected in renewed operation of bar mills this week. Some fair sized tonnages now are on schedule which were booked recently at 2.00c, Pittsburgh. Rumors are current that approximately 90 tons of angles of merchant mill sizes were booked here recently at 1.95c although producers deny participation in any sales lower than 2.00c.

Seek To Restore Higher Levels

Pittsburgh, March 22.—Merchant steel bars are not being bought in appreciable tonnages. The usual order is a carload, although exceptations appear from time to time. An effort is being made to restore higher levels, particularly on small lots, and 2.10c, 2.15c and even 2.25c, base, Pittsburgh, are recent quotations on carloads, some of which were closed, although 2.00c would apply on a sizable order. Makers, however, are disinclined to go below that level. This is against the 2.35c price maintained by the Carnegie Steel Co., some of whose customers are willing to purchase at that figure. Little change has come in the refined iron bar outlook. Some plants still are shut down and no business is developing. Concessions of $5 per ton do not bring in business. The Southern Pacific railway recently asked for some refined iron bars for engine bolts, stay bolts, etc. The most current business is in less than carload lots.

Bolt Demand Is Slack

Chicago, March 22.—Although a litt'e routine demand for bolts and nuts is being received by makers, the total business is light, and plants are operating only part capacity. General manufacturing operations using bolts and nuts are at a low ebb, and the heavy orders of a short time ago have passed. Backlogs have been fairly well worked out and only current business can be relied on now. Not enough business is being handled to test quotations, which remain at or slightly below the prevailing schedule.

Railroads Are Inquiring

Pittsburgh, March 22.—A few railroads are inquiring for nuts, bolts and rivets in a small way, including the Baltimore & Ohio railroad, Baltimore, which is asking for a fairly sizable tonnage. This character of business has not reached some of the plants here, and is not expected to do so until the railroad companies in this district receive payments from the government. Moreover, it is expected that general trading in these products will continue to be withheld until the railroad business starts. At present it is at a low rate, notwithstanding concessions of at least an additional 10 per cent, which are freely offered in an effort to get business. However, a slight improvement is noted in cold-punched nuts. Plant operations are becoming increasingly curtailed, many running portions of their machinery three or four days weekly. One plant which ran full last week probably will curtail during the present week. Jobbers only are buying on a hand-to-mouth basis, this being particularly true with reference to rivets.

Alloy Sales

Are Lacking, Despite Improvement Noted—No Spiegel Being Sold

Pittsburgh, March 22.—A slight improvement is discernible in the ferroalloys market, but large sales still are lacking, due no doubt to the fact that in many cases large stocks are held over. Some consumers in the Mahoning valley are understood to be asking for quotations on their year's requirements of ferromanganese, one naming 500 tons. The ferromanganese market is quotable at $90, delivered, although some producers are holding to levels as high as $100, delivered.

So far as reported the American Steel Foundries Co. has not closed on its inquiry of 300 to 500 tons of 50 per cent ferrosilicon, but it is understood to have bought a carload for Alliance, O. Most quotations are $92 or $93, delivered, although $91 appears at times. One producer's representative, however, recently quoted $80 on a carload. The Weirton Steel Co., Weirton, W. Va., recently purchased a carload of 25 to 30 per cent ferrosilicon. Even with a 15 cent quotation on domestic ferrochrome against the 16 or 16½ cents usually named, nothing is being done.

Practically no spiegel is being sold in this district, although it is reported that a few small sales involving 35 to 50 tons were made recently in the East at $32.50.

No Business Moving

New York, March 22.—In this market practically no new business is being done in ferroalloys. Quotations show little change. Producers of 50 per cent ferrosilicon are holding firmly to the range of $92 to $95, delivered. Ferrochrome is held firmly at 16c to 16.50c a pound contained, alloy containing 6 to 8 per cent carbon. A lot of 1000 tons of Indian 48 per cent chrome ore now in New York is being offered at a shade below 45 cents a unit. Ferrotungsten is quoted about 50 cents a pound contained, with little inquiry current. Tungsten metal powder remains quoted 60 cents a pound. Tungsten concentrates remain at $2.75 to $3 a unit. Ferrovanadium prices range from $5 to $6.50 a pound contained, with $7 quoted occasionally on small lots of high grade alloy.

Ferro In Small Demand

Chicago, March 22.—At least two inquiries for carloads of ferromanganese have been current in this market recently, one having been covered at $90, delivered. The other one is believed to be still open. Spiegeleisen is inactive, with practically no demand. It may be ob-

tained at $40.50 to $41.50, delivered, Chicago. One eastern producer is quoting $42.60, delivered, Chicago, and another $42, delivered in Chicago.

Wire Inquiries

Are Sizable and Numerous—Independents Expect Nail Advance

Pittsburgh, March 22.—Considerable improvement in wire products continues to be noted by the independent companies, particularly with reference to orders for fencing wire, both plain and barbed, and nails. Inquiries are fairly sizable as well as numerous and while many of them call for small lots, a healthy tone is sounded by reason of the fact that the business is widespread. This fencing wire business mainly is coming from the farmers. Some of the jobbers likewise are buying in a limited way, but there is absolutely no contracting being done. A desirable wire tonnage offered at 2.75c, base, Pittsburgh, was turned down by one independent maker in this district. A valley, maker refused to go below 3.00c on an offer of a desirable wire tonnage. The 3.00c price continues to prevail on nails and some makers are inclined to believe elements of strength in the situation are sufficiently numerous to permit of an early advance. The American Steel & Wire Co.'s operations continue to drop, some men in three plants being laid off last week. With prices at a 3.25c base on both wire and nails, it reports practically no new business being booked.

Strips Improve Slightly

Pittsburgh, March 22.—The slight improvement in hot and cold-rolled strip steel recently noted continues in small measure. Some new small orders and limited releases on suspended tonnages continue to come in, mostly in carload lots. Less than carload sales are numerous and the aggregate is fairly sizable. Operations probably do not exceed 25 per cent among makers and no statement is made regarding possible resumption on expanded lines, since, while inquiries are somewhat numerous, they do not rapidly turn into orders. Furthermore they frequently dwindle to 25 per cent of their original proportions. The more general quotations continue at 3.05c and 6.00c, base, Pittsburgh, on hot and cold-rolled strip, with the Carnegie Steel Co. still holding at 3.30c and 6.25c, against which some makers are quoting as low as 2.85c and 5.65c, respectively.

Hoop Orders Are Limited

Pittsburgh, March 22.—Small orders for hoops and bands are being received but no volume is involved. Some makers report that some small lots are asked for in company with specifications covering bars. One large independent reports a slight interest in the heavier gages of bands. Some of the independent companies still are naming 3.05c as a nominal quotation but are offering concessions under that level to their customers from $5 to $7 per ton, making the market quotable at 2.70c to 3.05c, base, Pittsburgh.

Less Shading on Plates

Price Cutting Not Stimulating Business. Eastern Mills Adopt Firmer Attitude—Steel Products Co. Books Tonnage for Australia

Philadelphia, March 22.—No improvement is noted in the demand for plates. Mills, seeing that lower prices are not stimulating buying are not so keen to shade. The minimum on attractive orders now is 2.00c, base, Pittsburgh, but most business in this district in the past week was comprised of smaller lots which went at 2.10c and 2.15c. On a Norfolk & Western railroad inquiry the lowest price quoted was 2.00c, Pittsburgh for plates, shapes and bars, but the company decided not to buy at present. Large inquiry is lacking. Both the Lukens Steel Co., and the Midvale Steel & Ordnance Co., will operate a mill each at Coatesville for about a week. The Central Iron & Steel Co., will start a mill Thursday and operate for a week.

Market Still Untested

New York, March 22.—Plate demand here continues quiet. The city of New York placed an order for a fireboat with the Standard Shipbuilding Co., Staten Island, and an eastern car manufacturer is in the market for a round tonnage of plates, shapes and bars. These are the principal requirements now before the trade here. The plate market here is regarded as 2.00c to 2.10c, base Pittsburgh, but there has been no business to afford a real market test. The United States Steel Products Co. has booked an order for 1100 tons of plates for Australia.

Small Lots Going at 2.15c

Cleveland, March 22.—Following the action of several Mahoning valley makers in elevating their quotations from the minimum point on the small tonnage now coming out, local plate makers now are naming a basis of 2.15c, Pittsburgh. Small lot sales, which is about all the market affords at present, were going at this level this week. Anything below 2.00c Pittsburgh now seems to have disappeared.

Current Business Low

Pittsburgh, March 22.—Current business in plates is developing at a low rate, one recent order calling for 100 tons. This was taken at 2.15c, base, Pittsburgh, while carloads are being sold at 2.25c. Some companies claim the latter figure is their minimum. However, it still is possible to buy at 2.00c on desirable tonnage. A few inquiries are coming out, although not any of these call for large lots. The Carnegie Steel Co. continues to name 2.65c, base, Pittsburgh, and reports a few small orders coming in.

Demand Continues Slow

Chicago, March 22.—Carbuilders are slow about placing orders for plates and mills have not booked as much as they had expected. The principal tonnage in prospect is for Louisville & Nashville cars, which were recently sold, but lack of haste in their construction has made it unnecessary to place this material promptly. It is understood that some of these plates have been awarded, but it is uncertain on what basis, and while a rumor has circulated that as low as 1.75c, Pittsburgh, was done, this cannot be verified, and it is doubted by many market observers. Manufacturers of tanks and boilers are moderately busy, but are not taking a large tonnage. The Illinois Steel Co. maintains its industrial board quotation of 2.65c, Pittsburgh, while the Inland Steel Co. is willing to take on prompt tonnages at 2.38c, Chicago.

Wait for Corporation to Act

Buffalo, March 22.—Plate business is very quiet. There are reports of orders being taken here at 2.10c, but these reports are not verified. Some sales agencies say that they would not consider meeting the 2.10c price.

Tin Plate Activity

Is About 30 Per Cent—Specifications Are Long Past Due

Pittsburgh, March 22.—Outside of an order for 15,000 or 16,000 base boxes of tin plate placed by a Pittsburgh district user with an Ohio mill, but little new business is developing in this product. Only a few specifications are being received and operations are on a descending scale. With the American Sheet & Tin Plate Co. below 50 per cent, a fair average among the makers probably would not exceed 30 per cent. Some February specifications are long overdue; aa great many for March and April have not yet come in and on Tuesday of last week orders for May were due, but for the three last mentioned months, shipping directions are few. While the fish pack in the Northwest will be small this year, this is not considered much of a market factor, since the entire fish-packing industry's annual requirement in normal times would equal about one week's production of tin plate by Steel corporation mills. This lack, however, is expected to be more than made up by the fruit packing industry of the West and of Hawaii. The California crop this year is expected to take at least 75 per cent of its normal requirements of tin plate, while operations in the Hawaiian islands in connection with pineapple are proceeding on the basis of 10 per cent in advance of last year's requirements, when the heavy crop was considered 100 per cent. While $7, Pittsbugh, continues the universal price here, concessions which lack confirmation are reported elsewhere.

Alabama Mills Resume

Birmingham, Ala., March 22.—Export orders just received warranted the resumption on Tuesday morning of the plate and blooming mills of the Fairfield works of the Tennessee Coal, Iron & Railroad Co., giving several hundred men employment. The plant was closed down Monday week March 14.

Scrap Prices Fall Sharply

Trading Continues at Standstill, Forcing Some Large Declines in Quotations—Loss on Eastern Pennsylvania Scrap Largest in History

FOR COMPLETE SCRAP PRICES SEE PAGE 864

Philadelphia, March 22.—Iron and steel scrap now is selling at prices netting sellers more of a loss than at any time in history. As an example, in 1898 borings sold at $6.50, delivered, with a freight rate of $1.85, while sales in the past week were at $9, delivered, with the present freight rate of $5. This figures to $4 at dealers' yards compared with $4.65 in 1898. In 1898, labor was 12.5 cents an hour, and now is 40 cents an hour. The same comparison holds in other grades and the market continues generally headed downward. Several hundred tons of heavy melting steel scrap were sold last week at $12.75 delivered and several small sales were reported on other grades.

Boston's Sales Decline

Boston, March 22.—The market in scrap iron and steel dropped further in activity during the past week and sales to consumers were so few and small as to be practically negligible. Just as some dealers were accumulating low priced borings and turnings to unload at practically no profit in the Pennsylvania district for the sake of having some transactions under way, the demand from Pennsylvania dropped off. Now a further decline from the already exceedingly low prices in this market would have to be made in order to make shipment possible. Machine shop turnings dropped from $5.50 to $4.50 but sales have been so light as to make prices in most cases purely nominal.

All Decline Except One

New York, March 22.—Absence of buying continues to weigh down the local scrap market, declines being noted in virtually all descriptions with the exception of cast material. The declines range anywhere from 50 cents to $1.50, steel axles and borings and turnings being the greatest affected. The reductions, however, are purely nominal. The only material that appears to be moving is cast scrap, which is being bought in small isolated tonnages. Despite the present dullness, no great volume of stocks is noted.

No Buying Going On

Pittsburgh, March 22.—Dullness continues to pervade the scrap market. Low prices are not attractive and buyers will not take tonnage except at prices so ridiculously low they become unattractive to dealers. For instance a steel company in this district would pay $7.50 for turnings, which if produced in Detroit would have to be purchased at $2 to give a 50-cent per ton profit. The Allegheny Steel Co., might purchase some heavy breakable cast at a low price. Open-hearth furnace operations at the Pittsburgh Steel Co. are slightly increased but this has not caused any scrap buying. Outside of the periodical railroad lists, no industrial scrap lists are current, except one from the Westinghouse Electric & Mfg. Co. on approximately 2000 tons, on which it is taking bids until March 24. The Pennsylvania railroad recently sold some steel axles a little in advance of $18, hence this grade is dropped from $22 and $23, to $18 and $19. With heavy melting steel at $13 to $14, railroad coil and leaf springs as well as knuckles and couplers are dropped to $14 and $15. Low phosphorus billet and bloom crops are down $2 as is No. 2 railroad wrought and steel car wheels, while sheet bar crops have declined $1 per ton.

Drop To New Level

Buffalo, March 22.—The scrap market has again found a new level with heavy melting steel down to $11.50 to $12.50. One buyer in this district is now offering no more than $10 and insisting on No. 1 grade with strict inspection. Not much selling is being done at this figure. Some activity exists in stove plate, probably 500 to 600 tons having been sold in small lots. The general price was $19.

Buyers Not Attracted

Cincinnati, March 22.—Weakness and extreme dullness continue to characterize the Cincinnati iron and steel scrap market, in which there has been no activity for several weeks. Buyers have not been attracted by recent price declines which have brought market values to an exceptionally low level.

Prices Cut All Along Line

Cleveland, March 22.—With a dullness never before reached in the scrap trade, local dealers are marking down their prices in an effort to attract consumers. Dealing has been almost wholly lacking and quotations regarded as bottom or close to it now are in the discard. Reductions have been made all along the line, only one or two grades excepted. Heavy melting steel is down $1 to $13 to $13.25 while $2 has been taken from machine shop turnings now quoted at $7 to $7.25. Cast borings have been cut $3, the new quotations being $9 to $10.

Demand More Keen

Detroit, March 22.—Heavy melting steel and pipe scrap are slightly higher with demand a little keener in the Detroit scrap market. The market in other lines was dull, however, though prices remained stable. Conditions are brightening in the big Detroit automobile plants, however, and dealers in scrap look for better conditions to result in scrap.

Lower Prices at Chicago

Chicago, March 22.—Prices on iron and steel scrap continue to decline. Heavy melting steel this week touched $11.50 per gross ton, with no demand and practically no shipments. Borings and turnings are down to $7.75 and $6.25 per gross ton respectively, and at these prices scarcely can be handled over any distance. Specials like iron car axles and shafting, which have been holding to a relatively high level, have begun to decline with greater rapidity. The general list is decidedly lower than a fortnight ago. About the only grade in which any movement is taking place is cast scrap, of which foundries are taking a little. Steel grades and rolling mill scrap are not being moved at all. Railroad offerings are much less than during recent weeks. The Northern Pacific has withdrawn its recent list, refusing to sell at the offers received. The Chicago, Burlington & Quincy offers 3500 tons, including 800 tons of No. 1 wrought, the Chicago Great Western offers 400 tons, and George W. Jennings 600 tons, of which 400 tons are iron wheels.

Dealers Quit Trading

St. Louis, March 21.—The story of scrap in this district is one of continued quietness and declining prices. None of the industries is purchasing and the usual exchanges between dealers have almost disappeared. Prices show further sharp recessions. Yard interests during the past few weeks have been picking up small tonnages which they considered bargains. Railroads are still offering scrap, but in lesser amounts. The only list before the trade was one from the Missouri, Kansas & Texas for 350 tons. The Frisco disposed of its last 2700 tons, which included 1500 tons of mixed scrap, to dealers at fair prices. Country grades are scarce, and result in such eccentric manifestations as railroad malleable selling at a discount of 50 cents under agricultural malleable, and stove plate scarce, with all cast grades in abundant supply and virtually unsalable.

Further Deflection Noted

Birmingham, Ala., March 21.—The scrap market is slipping back again. For a few weeks there was some demand for No. 1 cast and other grades. This has stopped suddenly. Consumers are not buying. Cast iron pipe makers, who have been buying a little cast, are not in the market and indicate in the future they will close for material as their immediate needs indicate.

Oil Country Goods

Show Increased Activity—Mexico Places 7000 Tons of Pipe

Pittsburgh, March 22.—Considerable improvement is noted in pipe, particularly in oil country goods. An order was placed for several miles of 6-inch line pipe and receipt of a fair number of smaller orders as well as several sizable inquiries involving from 4 to 10 miles of different sized pipe is reported. These come mainly from the Kansas and Oklahoma fields although new projects in Montana and Wisconsin give much promise. Considerable export business is developing, inquiries being reported from South America, Mexico, Trinidad, the East Indies, India and Roumania. One export inquiry recently received involved 1500 tons.

Some little improvement is seen

in standard merchant pipe, although building operations are still held down and there is a decided dearth of orders. New business is slow in developing for the National Tube Co., as well as several of the other steel pipe makers and while its Riverside plant at Benwood, W. Va., is the only one of its several plants closed down, other operations are somewhat curtailed, McKeesport being slightly under 75 per cent.

Wrought iron pipe makers report a slight influx of orders as a result of the recent lowering of prices. More inquiries now are turning into orders. Some of the jobbers are ordering to piece out their stocks, but this business is not sufficient to bring about increased operations. The A. M. Byers Co. is understood to be operating around 60 per cent this week while the Reading Iron Co. has three out of seven furnaces going.

Good Buying in East

New York, March 22.—Demand for welded pipe continues more active than for any other finished steel product as far as this district is concerned. Despite this, the pipe mills continue to need business. There is no talk about cutting pipe prices as a reduction would involve issuance of a new card and apparently there is no intention on the part of any of the makers to take such action. The United States Steel Products Co. has booked an order for 7000 tons of steel pipe for an oil company in Mexico.

A quickening of demand is undoubtedly in evidence in the eastern cast iron pipe market. This is not especially manifest in municipal inquiry, but in private demand there is a marked increase. One seller stated in the past week he booked more tonnage of this character than he had in the preceding two months. The largest municipal inquiry is that of Boston, involving 2000 tons of cast iron pipe ranging from 6 to 36 inches. Bids are to be closed March 28.

John Fox & Co. has been awarded two subcontracts involving 500 tons each for the city water department. Further city water work is to develop shortly. Tentative specifications have been issued in one project involving 1800 tons and specifications on a similar tonnage are to be issued shortly. The Lord Construction Co. is figuring on 500 tons for a government job at Lakehurst, N. J. Recent awards involve 250 tons which the Consolidated Gas Co., New York, placed with the United States Cast Iron Pipe & Foundry Co., and 300 tons for the Brooklyn United Gas Co. Larger tonnages are bringing out concessions ranging from $1 to $4 and $5 and it is likely the entire market will be reduced soon.

Inquiry Continues Light

Chicago, March 22.—Inquiry for cast iron pipe has fallen off sharply and comparatively little tonnage is now in prospect. Hamilton, O., will open bids March 23 on 200 tons. The American Cast Iron Pipe Co. has been awarded 265 tons at Fort Wayne, Ind. The United States Cast Iron Pipe & Foundry Co. has been awarded 350 tons at Columbus, O., while the Lynchburg Foundry Co. is low bidder on 300 tons at Springfield, Ill., on which the award has not yet been made.

Cancel Sheet Quotations

Mohoning Valley Makers Who Were Meeting Competitors' Prices Will Now Quote Only on Specifications—Barrel Makers Seek Tonnage

Youngstown, O., March 22.—Practically all sheetmakers here who recently have been meeting competitors' prices of 3.00c for blue annealed, 4.00c for black and 5.00c for galvanized have withdrawn quotations and now are naming prices on individual specifications only. Their action was based on the fact that the amount of current business when distributed on various mill books was not enough to operate at a profit. Rather than operate at a loss, therefore, many mills in this district are idle pending the accumulation of orders at profitable prices. The market here as far as can be interpreted after a canvass of the mills is quotable between 3.10 to 3.30c for blue annealed, 4.00 to 4.20c for black and 5.00c to 5.25c for galvanized with a large proportion of the sales of blue annealed at 3.20c, black at 4.10c and galvanized at 5.00c. The demand for all grades is exceedingly light. Not much improvement is noticed in the market for fine finished sheets, despite reports that automobile makers have increased their operating schedules recently. Nor is much improvement contemplated until well into the middle of this year. It is pointed out automobile interests guaranteed prices until June 1, 1921 and it is to their advantage, therefore, to use as many sheets purchased at higher than prevailing prices as possible. Thus they would be in a position to start off the second half of the year with prices in line with lower cost steel, at the same time minimizing their stock liquidation. Stocks of automobile sheets at consumer's plants are large and until these stocks are reduced considerably no concerted buying movements from this source is expected.

Releases Still Are Received

Pittsburgh, March 22.—While the improvement so far in the automotive industry as regards sheets is not reflected in sizable new business, releases continue to be received. New orders are received from time to time, however, several coming in one day late last week to the American Sheet & Tin Plate Co., involving five or six carloads. This company's operating schedules probably will not exceed 40 per cent, with more plants slowing up, while it is doubted if the independent companies' average operations is above 30 per cent at present. An eastern bodymaker has received shipping instructions from Dodge Bros., on bodies made up since last October. The Willys-Overland Co., Toledo, O., likewise is more active on specifying sheet tonnages. Some companies have endeavored to reinstate higher prices but are not meeting with much success, since not much business is current. While reports of 2.85c and 4.85c are heard on blue annealed and No. 28 galvanized, respectively, these are not confirmed by producers here, although several companies are naming 3.00c, 3.85c and 5.00c on blue annealed, No. 28 black and galvanized, against the American Sheet & Tin Plate Co's. prices of 3.55c, 4.35c and 5.70c. One valley producer is naming 4.20c as a minimum on No. 28 black, although on tonnage business concessions would be offered. It is stated freely that the attitude of the building trade unions in not receding from their position as to high wage rates is what is causing the demand for sheets for building construction to be withheld.

Stock Material Sells Low

New York, March 22.—Sheet demand, while small, is better in this district than that for other steel products outside of wire and pipe. All of the current demand is for small and moderate sized tonnages for prompt shipment, and the mills are anxious for these orders and are offering their minimum price. The minimum on blue annealed sheets to be rolled is 3.00c, Pittsburgh, for No. 10 gage. The usual minimum on No. 28 black sheets to be rolled is 4.00c, Pittsburgh, for No. 28 gage, although in some cases sales have been made at as low as 3.85c and 3.90c. In most cases the minimum on galvanized sheets to be rolled is 5.00c, Pittsburgh, although there have been transactions involving several carloads each, around 4.80c. Black seconds and cut-downs have gone at 2.50c, base Pittsburgh, and galvanized cut-downs and seconds at 4.00c, base Pittsburgh.

Barrel Makers Negotiating

Cleveland, March 22.—Sheet mill representatives in this territory are taking considerable encouragement from inquiries now being put out by local manufacturers other than automotive interests. Two 1000-ton, one 500-ton and several smaller lots are under active negotiation. It is understood steel barrel makers in this city are needing sheets with prospects encouraging for additional lots. The general sheet trade otherwise is quiet, but a tendency is perceptible in the market to pass up business that seeks only the minimum quotation, this being true especially of blue annealed and black sheets.

Demand Improves; Prices Firmer

Philadelphia, March 22.—Demand for sheets has improved, but not enough to make much difference in mill operations. The mills reflect a slightly firmer attitude on prices, and 3.00c, base, Pittsburgh, apparently is not shaded on orders for blue annealed to be rolled. Black sheets are being sold at 3.85c to 4.00c and galvanized 4.80c to 5.00c. Most current demand is for galvanized.

Demand Slightly Better

Chicago, March 22.—Some additional business in steel sheets is coming to makers from automobile and accessory manufacturers as well as from export sources. As a result of this demand, the Inland Steel Co. has been able to increase the number of its active sheet mills and now has 12 in operation. Prices are unchanged with 3.38c for No. 10 gage blue annealed, 4.38c for No. 28 gage black, and 5.38c for No. 28 gage galvanized at Chicago mill.

Structural Activities Gain

Numerous Small Awards Made and Several Large Contracts Are Pending —7000 Tons Placed at Chicago—February Bookings Shrink

New York, March 22.—The eastern structural market is still devoid of demand of consequence, notwithstanding the heavy tonnage which has long been pending. The largest award during the past week was 400 tons. The outstanding inquiry calls for 450 tons. Prices remain far from settled, and during the past week one mill booked 300 tons of shapes in this district at 2.50c, Pittsburgh. This is the lowest price so far reported.

Further shrinkage in the bookings of fabricating shops throughout the country was shown in the regular report of the Bridge Builders and Structural society for February. The total was 25,600 tons, as compared with 32,000 tons in the preceding month. Following are further comparisons:

Month	Per cent	Tonnage
February, 1921	14	25,600
January, 1921	18	32,000
December, 1920	26	47,000
November	27	49,200
October	25½	45,600
September	43	77,400
August	40	72,000
July	50	90,400
June	50	90,400
May	61½	110,000
April	68	122,250
March	83½	150,400
February	95	171,000
January	75	135,000
December, 1919	85	153,000
November	69	124,200
October	77½	139,500
September	78⅝	141,000
August	18½	141,000
July	74	133,200
June	65	117,000
May	49	88,200
April	26 5	48,100
March	17½	32,300
February	12½	22,500
January	12	21,600

Strike Still Effective

Boston, March 22.—The major portion of the structural work in the Boston district is still at a standstill, due to the strike of building mechanics, yet statistics covering building permits indicate the present construction in Massachusetts is nearly 50 per cent greater than the average in January. An increase in the amount of work projected is reported by most of the structural companies. Prices of steel are still soft, in this district, and reports of 2.00c shapes are common.

Large Jobs Are Let

Pittsburgh, March 22.—For the first time in several weeks, large awards are reported among fabricators. The McClintic-Marshall Co. has been awarded the International Nickel Co. job at Huntington, W. Va., involving 3000 tons. A number of other small jobs have been placed. The Carnegie Steel Co.'s price on plain shapes remains 2.45c while 2.00c, base, Pittsburgh, is the general quotation, although some companies are endeavoring to obtain 2.15c and 2.25c on carloads.

More Work Is Figuring

Cleveland, March 22.—Structural undertakings coming up for action in this district represent a considerable tonnage. A local contractor has asked and received bids from some mills on 8000 tons of steel sheet piling. Because of the unusual size of this inquiry, some doubt is expressed over its development into tangible business. The Lackawanna Steel Co. has received 700 tons of piling for the Federal Reserve Bank building, Cleveland. All bids on the 2400 tons for the Wade Park Manor job, Cleveland, have been rejected for the second time. Contractors again are figuring on the Belle Isle bridge job, Detroit, bids to close in about a month. The 1300 tons involved in the River Rouge bridge, Detroit, has been awarded. Some fabricators in quoting on new work continue to figure in the steel at 2.00c, Pittsburgh, and the indications are they are getting their material on this basis.

Chicago Tonnage Goes East

Chicago, March 22.—Two of the largest structural tonnages recently offered in Chicago were awarded last week to eastern fabricators, who will take both the plain material and the fabrication from this district. The largest tonnage was 6986 tons for the United States Mail Terminal building in connection with the Chicago union station. This was awarded to the McClintic-Marshall Co. and Bethlehem sections will be used. Competition was unusually keen and the low bid was about $1 per ton below its next nearest, and this in turn was about $1.10 below the next. It is understood the price fabricated and delivered in Chicago was approximately $75 per ton, which is considerably below quotations of recent weeks. The other tonnage covered steel for two viaducts in connection with the union station, 753 tons, which was awarded to the Fort Pitt Bridge Works. General buying of structural material is slack. The Illinois Steel Co. has not deviated from its regular quotations of 2.45c, Pittsburgh, while the Inland Steel Co. is willing to furnish material in attractive quantities at 2.38c, Chicago.

Only Small Tonnages Sold

Philadelphia, March 22.—Shape buying here continues to involve only occasional and small tonnages, going generally at 2.10c, Pittsburgh, but in some cases higher. One sale went at 2.00c. Structural lettings are lacking, but structural projects are more numerous.

CONTRACTS AWARDED

Gas container, Los Angeles Gas Co., 3000 tons shapes and plates, to Hayward & Bartlett, Baltimore.

Fifth Avenue Baptist church, New York City, 400 tons, awarded to Levering & Garrigues.

United States Mail Terminal building for Chicago Union Station Co., Chicago, 6986 tons, to McClintic-Marshall Co.

Canal and Van Buren street viaducts for the Chicago Union Station Co., Chicago, 753 tons, to Fort Pitt Bridge Works.

Seaplane hangar at San Diego, Cal., 414 tons, to Phoenix Bridge Co.

Buildings for the International Nickel Co., Huntington, W. Va., 3000 tons to the McClintic-Marshall Co., Pittsburgh.

Bridge over River Rouge, Detroit, 1300 tons, to Strobel Steel Construction Co., fabrication to be done by Mt. Vernon Bridge Co.

Factory building for the Logan Clay Products Co., Logan, O., 215 tons to the Pittsburgh Bridge & Iron Co., Pittsburgh.

Bridge in Trumbull county, 100 tons, to McClintic-Marshall Co.

Dam No. 45 on Ohio river, 100 tons to the McClintic-Marshall Co.

Terminal railroad bridge, St. Louis, 200 tons to the McClintic-Marshall Co.

Steel sheet piling for Federal Reserve building, 700 tons, to Lackawanna Steel Co.

Plant for the Chemical Products Co., Trenton, Ont., 600 tons, to a Canadian contractor.

CONTRACTS PENDING

State hospital for insane, Morris Plains, N. J., 450 tons, contract pending.

Detroit Jobs Call for Concrete Bar Tonnage

Cleveland, March 22.—Public improvements at Detroit now active will require 8000 tons or more of reinforcing bars. The Collis creek sewer now up for bids calls for 5100 tons of bars and a new waterworks system for which the general contract has been placed with the Thompson-Starrett Co., 3000 tons or so roughly. About 240,000 tons of cement will be required for these jobs. A 160-ton concrete steel job at Baltimore, O., has been awarded. Reinforcing bars remain around 2.00c Pittsburgh or mill. Various makers now are waiving the extra of 7½ cents per 100 pounds on deformed bars.

Low Prices Develop

New York, March 22.—Liquidation in the concrete reinforcing bar market is bringing out low prices. These are being quoted not only by mills but also by brokers who are taking losses. Attractive tonnages placed during the past week went at prices ranging from 1.90c to 1.97½c, Pittsburgh. Smaller tonnages have gone at as high as 2.35c, Pittsburgh. On concrete bars out of stock in New York prices cover a wide spread. A large tonnage has been sold out of stock here at as low as 1.90c, Pittsburgh. Among the biggest jobs now pending is one involving 500 tons for a hotel in Williamsport, Pa. In this district, local projects comprise school buildings principally and 25 to 30 such projects are pending in New Jersey and Connecticut. Bids will be opened shortly on a shaft for the proposed New York-New Jersey vehicular tunnel; involving 340 tons of bars.

Sales Are Small

Pittsburgh, March 22.—Odd lots of reinforcing concrete bars are being asked for and small sales only are reported. The usual quotation is 2.00c, 2.10c and 2.15c, base, Pittsburgh, against the Carnegie Steel Co.'s price of 2.35c. At times 1.90c and 1.95c are reported but these are not traceable.

CONTRACTS AWARDED

Building, San Diego, Cal., 750 tons, to Southern California Iron & Steel Co.

Building for De Laval Steam Turbine Co., Trenton, N. J., 115 tons, to Pardee Steel Corp.

Paper manufacturing building, Baltimore, O., 160 tons, to the Concrete Steel Co.

CONTRACTS PENDING

Collis creek sewer, Detroit, 5100 tons, bids being taken.

Two bridge spans, 450 tons; bids being taken by California state highway commission.

Hotel at Williamsport, Pa., 500 tons.

Shaft for New York-New Jersey vehicular tunnel, 340 tons.

Oak street viaduct, Youngstown, O., bids now being taken.

Waterworks extension, Detroit, about 3000

tons, general contract to the Thompson-Starrett Co.

Large Tonnage

Of Rails and Track Material Bid Upon for City of Detroit

Cleveland, March 22.—Bids have gone in on about 15,000 tons of rails and track material for the proposed municipal street railway lines at Detroit, but no award has been made. These requirements include 11,200 tons of 100-pound rails, 40,000 steel ties, totaling about 2000 tons and 2 miles of light rails, ties and fastenings.

Books 800 Cars for Canada

New York, March 22.—An order for 800 small cars has been placed with the Magor Car Co., for shipment to Canada. This is by far the largest contract awarded, other business being light.

The Santa Fe railroad is inquiring for 300 gondolas; the St. Louis, Troy & Eastern, 75 box cars; the Baldwin Locomotive works, 100 tank cars for export, and the United Fruit Co., 50 ballast cars.

New Demand Developing Slowly

Pittsburgh, March 22.—Current business in light rails continues to fluctuate from day to day. The recent 800-ton inquiry from England has disappeared. The experience of most makers is that while individual orders and inquiries are small, a fair tonnage is represented. This business is developing from three main directions; some coal mines, general contractors, and a number of industrial companies. Prices from 2.15c up to 2.45c, Pittsburgh, are prevailing, while on relaying rails, from $40 to $43 applies.

The demand for spikes is somewhat less than a few weeks ago, and a disinclination to place orders is noted. Several railroads have stated they will not buy for the present. Spike machines are operated only as needed. On other track products such as tie plates, angle bars, track bolts, etc., concessions are offered but they are not bringing out tonnage business. Spikes are quotable at 3.30c to 3.65c; tie plates, 3.00c; angle bars, 2.45c to 3.00c, base, Pittsburgh.

Bethlehem Takes Tonnage

The Bethlehem Steel Co., in open competition has been awarded 1000 tons of rail joints and 2500 tons of tie plates for the Boston & Maine railroad. The price per net ton for the tie plates quoted by the Illinois Steel Co. was $73.20, delivered. The Bethlehem Steel Co.'s price was $56.70, delivered. On rail joints the Carnegie Steel Co. bid $3.56½ per 100 pounds, delivered. The Midvale Steel & Ordnance Co. bid $3.54. The Lackawanna Steel Co. bid $3.20, mill, and the Bethlehem Co., $3.20, mill. The Maine Central railroad placed 700 tons of tie plates and $50,000 worth of frog and switch work.

Many Bid at Tool Sale

Approximately 140 manufacturers and machinery dealers attended the sale of surplus machine tool and machinery equipment held at the plant of the Savage Arms Corp., Utica, N. Y., March 16. The sale was conducted by C. A. Calleson, of New York City, and 450 lots of machinery were sold.

Note Sheet Bar Inquiry

Demand Picks Up Slightly at Cleveland and Pittsburgh—Skelp Most Active Feature of Semifinished Market, However

Pittsburgh, March 22.—Probably the most active of the semifinished lines skelp, is being sold in limited quantities, and one company reports moving 3000 tons in three days last week. Some of this was for export to England and Canada, and while in these cases higher prices were obtained, the usual quotations now are 2.20c 2.30c and 2.40c, base, Pittsburgh, on grooved, universal and sheared skelp, respectively, as against the Carnegie Steel Co's. prices of 2.45c, 2.55c and 2.65c.

A broker is endeavoring to place an order for 1000 tons of sheet bars at $35, base, Pittsburgh, price, but so far has not been successful. This probably could be placed at $38, although some companies are holding to $40 and $42, without making sales. Several inquiries were received in the past week for sheet bars, but no important tonnage was involved, except possibly one, in which an eastern user asker for 1000 tons.

Rerolling billets, slabs and forging billets are inactive, and on the first two products $38 or $38.50 is considered the market, while a forging billet inquiry recently brought out a $43.50 price. A few small inquiries are coming out from forge shops but the aggregate is small. The same measure of indifference applies to wire rods. The general quotation remains $52, as against the American Steel & Wire Co. price of $57, base, Pittsburgh.

Buying Almost Entirely Stopped

Philadelphia, March 22.—Demand for semifinished material continues almost entirely lacking in this district. The only buying reported is a few tons at a time. Prices are nominal at $38.50, Pittsburgh, for rerolling billets and $42.50 for forging billets.

The Tacony Steel Co., has started up to make alloy ingots on an order for 500 tons released by the Hyatt Roller Bearing Co.

Slack Demand at Youngstown

Youngstown, O., March 22.—With curtailed operation in the sheet rolling industry, the sheet bar market continues dull. No inquiries so far as can be learned are before makers here. Sheet bars are quotable from $38 to $40, Youngstown, although it is thought the lower figure is more representative of the present market. The demand for billets and slabs is exceedingly slack. Standard size billets are quoted between $38 and $40, Youngstown.

Inquiries More Numerous

Cleveland, March 22.—Inquiries for various forms of semi-finished steel, particularly sheet bars, have been more numerous. One northern Ohio consumer seeking to buy 500 tons of sheet bars, Pittsburgh or Youngstown, at $35 Pittsburgh, was unsuccessful. Prices quoted were around $40, delivered, or approximately $38, Pittsburgh or valley. Other 500-ton lots of sheet bars have come before sellers in this territory, including one for Japan. An Indiana buyer asked for 500 tons of small billets and inquiry for 1000 tons of slabs appeared this week. Buyers of slabs in northern Ohio have been offered sharp inducements by distant makers which are reported to figure back to about $32.50 mill.

Addresses Foundrymen

H. Cole Estep, European manager of THE IRON TRADE REVIEW, addressed the Chicago Foundrymen's club, March 21, at the most largely attended session it has had in years. He gave an account of the business and social conditions of Europe at present and expressed the opinion that getting back to something like a normal condition is progressing steadily and without untoward incident, and that conditions there are not essentially unlike those in the United States. The club unanimously voted to make him an honorary member.

Reject Oil Tank Bids

Washington, March 22.—The shipping board has decided to reject all bids received Feb. 25 on 12 55,000 barrel fuel oil tanks, to be erected near Norfolk, Va., on which the Pittsburgh-Des Moines Steel Co. was the lowest bidder. The bids were on the basis of f. o. b. manufacturers' works. It is understood new bids will be called for, and that the government itself will not erect the tanks, as originally planned.

Babbitt to Operate June 1

Duluth, March 22.—The Mesabi Iron Co. has announced that its new ore sintering plant, at Babbitt, on the Mesabi range, will begin operations about June 1, and that shipments will begin about July 1. Its product is to be known as Mesabi sinter. Clement K. Quinn & Co. of Duluth, have been appointed sales agents.

Cut Nails Lower

Pittsburgh, March 22.—While the Reading Iron Co. continues to name 4.00c on carload inquiries for cut nails, and 4.10c for less than carloads, concessions under the 4.00c figure on less than carloads are being offered. Buyers recently were able to place some small orders at around 3.75c.

Warehouse Prices Hold

New York, March 22.—Although demand remains listless, prices in the local warehouse market continue steady. This is attributed principally to the stablizing influence of the Carnegie Steel Co. with warehouses at Waverly, N. J. Until this interest changes its price list, the market will in all likelihood remain the same, it is said. Reinforcing bars are moving in better volume than any other description.

Bright Spots in Export Markets

American Traders Show Considerable Interest in European Developments—Chile Opens Large Rail Bids—Mexico and Manchuria Submit Inquiries for Railroad Material—China Joins Japan in Buying Movement

NEW YORK, March 22.—Orders from the Orient, while small in comparison with those that were received about a year ago, are lending more confidence to the iron and steel export market. Coincident with these orders a number of new and attractive inquiries are coming in and the indications are that the Orient, Japan especially, is recovering from the slump which has depressed international business for about a year. The prices at which the American products can be sold to these buyers are low however. Some of the inquiries which are being given serious consideration stipulate the maximum base price that can be paid which is lower than the domestic level.

The Oriental business is really the bright spot on the horizon. Mexico, which most of the export houses expected to open up immediately, continues to hold off as a buyer. The Mexican business is as yet little more than a promise, although some few orders are coming in now and then. American exporters confess that a great deal is now depending upon the development of conditions in Europe. The signature of a trade treaty between Russia and England is the opening wedge they have been hoping for. This, exporters are informed, is to be followed by treaties with Russia by Turkey, Germany, Poland and the so-called buffer states, and Italy. The United States, naturally, will join in any feasible scheme to rehabilitate Russia and Japan is also favorably inclined. The meaning of this move, it is said, is that a large share of the banked-up surplus of goods will be relieved. The opening of Russia means that continental iron and steel products will find a market there which should have its effect in strengthening the general iron and steel export situation.

It is reported that the French producers as a result of the reduced coal prices, have been able to quote lower prices than the British. The German prices, however, are still lower than either the French or British. One American export house holds an inquiry from Scotland for 131 tons of bolts to be used in a transmission tower. England is reported to have made another skelp purchase on this side although the tonnage was not disclosed.

Car builders report an increase in their exports during last January. Passenger cars exported during that month totaled 64, valued at $520,293, more than twice as large as for any month of last year. Cuba received the largest share of these units. Exports of freight cars during the first months of 1921 stood at 1452, valued at $2,535,887, and recorded a slight decline from the month previously. There was also a slight decline in the exports of locomotives in January. These totaled 149, involving an outlay of $4,248,147. Of these Cuba took 66 and Brazil 23.

Mexico Buys Pipe

Latin-America shows no recovery of importance. Mexico is talking of buying 20,000 tons of rails and the inquiry has been submitted rather generally in this market but there are no signs of an order developing as yet. It was reported, however, that Mexico has ordered 7000 tons of pipe. England underquoted American producers on 2000 tons of structural to Mexico and made that sale.

The Chilean railways opened bids on 12,000 tons of rails March 17. According to reports received the Belgians submitted the lowest bids, although both the United States Steel Products Co. and the Consolidated Steel Corp. are hoping to receive a part of the awards.

It is said that 300 low-side freight cars are in demand by a commercial agency located in Brazil. Bids for tramway materials, gas and steam operated motor cars, railway tools and equipment, hydroelectric plant supplies and furniture are wanted by the National Tramway Co. in Quito, Ecuador. From Uruguay the information has been received that a new branch line railway is planned between Almos and Montevideo.

Thee South Manchuria Railway Co., which, since its formation, has made extensive purchases of American prouct, is reported to plan the expenditure of large sums within the next five years. Purchases made by the South Manchuria Railway Co. normally include not only railway supplies, but also equipment for coal and iron mines, iron and steel foundries, electric plants, gasworks, coast steamers, oil mills, flour mills, hospitals, hotels, laboratories, waterworks, agricultural experiment stations and numeorus other enterprises. Japan has been buying much of the material for this railway system.

Rails Wanted For Manchuria

One of the Japanese inquiries just received in the market for the South Manchuria railroad is 10,500 tons of 100-pound rails, of which 800 tons represents accessories. The commercial attache at Pekin reports that the Tientsin-Pukow railway is to purchase 11 block-steel car trains, of five cars each, to include compartment sleepers and observation coaches. An electric tramway line from Siangtan to Changsha, a distance of about 30 miles, is considered. Plans include the possible purchase of 15 cars. An electric light and power plant is to be installed at Natungchow. Machinery for a 4000 horsepower plant is said to have been ordered from Germany.

China has ordered another carload of cold-rolled shafting in the United States. It also is submitting heavy inquiries for steel mill machinery. One American export house is holding a Chinese inquiry for 15 miles of 24-inch water pipe.

Through one New York agency, Japan recently has purchased in the United States 300 tons of bridge material, 300 tons of black sheets, 200 tons of galvanized wire and 40 tons of fire-box plates. One exporter reported a Japanese inquiry for 5000 tons of structural material for bridge work. An inquiry for 4000 tons of structural material or an electrical transmission tower for Japan also has been in the market a number of days. Another exporter holds a Japanese inquiry for 3000 tons of 60-pound rails. Through this same house that country has purchased 500 tons of 30-gage sheets.

German steelmakers within the past few weeks have sold three lots of standard open-hearth rails, aggregating 4300 tons, to Cuban buyers at delivered prices which are considerably lower than the figures quoted by American interests. A surprising feature in connection with this business was that the Germans extended credit arrangements whereby the Cuban buyers will make payments six months to a year after the rails have been delivered. The United States Steel Products Co. has closed orders for 2400 tons of rails for India and 2000 tons of rails for Brazil.

Labor Seeks Change in Rail Law

Activities of Union Leaders Indicate Effort May Be Made To Force Congress To Repeal Part of Transportation Act and Set Up Old Labor Board Which Would Give Employes Advantage in Wage Fight

WASHINGTON, March 22.—Tactics of the railroad labor union leaders are so shaping themselves as to give rise to the belief here that these leaders at the coming special session of congress, will attempt to force through congress a repeal of at least part of the Transportation act in much the same fashion they forced the Adamson 8-hour act upon the country. Labor's attention is being centered more and more upon the provisions of the Transportation act which set up the railroad labor board. Apparently the objective is to render it impossible for the railroads to reduce wages at this time.

As now created and in operation, the railroad labor board consists of nine members, three in each of the public, railroad and railroad labor groups. The presence of the three representatives of the public will make it possible for a decision to be reached by either the labor and the public groups or by the railroad and public groups. Railroad labor is aware that the public desirous of lower passenger and freight rates, is sensible to the carriers' plea that lower rates cannot come until wages have been reduced, and it is fearful lest this sympathy be translated through the public's representatives on the labor board.

If possible, it is the belief in Washington, labor will seek to have the labor board provisions stricken out of the Transportation act and the old-time bipartisan boards reinserted. This would leave all labor problems to be decided by representatives of the railroads and labor, and make impossible a decision or compromise except by agreement. Where the railroads now might force through a reduction in wages by a joining of the railroad and public representatives on the railroad labor board, under the old system the railroads could not act except in conjunction with labor. A refusal on the part of labor, then would mean that the roads could not act, which is precisely the end sought by labor. A good many people in Washington would not be surprised to see labor attempt to embarrass the Harding administration in its early days by threatening a general strike unless it assents to the return of the bipartisan boards. Still another phase is the fact that within a few months the President must name a new member on each of the three groups of the present board, and labor undoubtedly will bring pressure to bear for the naming of men not inimical to labor.

Lumber Rate is Reduced

The expected start in freight rate reductions appears to have come to pass a few days ago when the transcontinental railroads obtained the permission of the interstate commerce commission to cut rates on lumber from the Pacific coast to Omaha and Chicago. The effect is to make the rate to Omaha and Missouri river crossings the same as to St. Paul. Likewise, the rate to Chicago via Omaha will be the same as that by way of St. Paul. The rate on lumber per 100 pounds, from the west coast to Omaha thus will be reduced from 73½ cents to 66½, and to Chicago from 83 to 70 cents.

The lumber interests proved to the carriers that the high rate effective last Aug. 26 actually was stifling business, and that the actual net return to the roads would be greater under a reduced rate through stimulation of traffic than it has been at the increased rate.

Railroad officials and interstate commerce commission officials look with much gratification upon the increase in railroad traffic in the first week of March. Following the worst February in recent years, hope is expressed that March will show an increase. In the week ended March 5 the railroads loaded 712,882 carloads of revenue freight, against 658,222 in the preceding week and 811,106 in the corresponding week of 1920. The week of March 5 was the best since the third week of December, and is the greatest increase in any week since the slump set in last October. In the week ended March 5 loading of coal amounted to 143,436 carloads, compared with 142,226 the preceding week; of coke, 7828 carloads against 8109 the previous week and of ore, 7315 carloads against 7196 the previous week. The daily average of surplus freight cars in the week ended March 8 was 422,207, a slight increase from the preceding week.

A report of the car service division of the American Railway association shows that on March 1 the total of bad order freight cars was 243,586 out of a total of 2,273,033 cars on line, the percentage being 10.7. On Feb. 1 the percentage of bad order freight cars was only 9.7. On March 1, the association's report shows 67 per cent of all freight cars were on their home lines, an unusually low percentage but not likely to prove troublesome because of low freight loading.

Railway Supply Exhibit Largest Ever Held

Chicago, March 22.—More exhibits than ever before were shown at the Coliseum last week when the National Railway Appliances association held its annual exposition, the annex being filled and space also provided in the ballroom, the main floor being insufficient to care for all those who desired to reach the attention of the railroads.

In spite of untoward conditions generally in the average railroad purchasing department the show was attended by a large number of buyers and users of material and interest in offerings of the manufacturers was keen. The assortment is wide, ranging from track material and devices for maintenance to rolling stock, signaling apparatus, etc. Iron and steel products predominated in many exhibits. The Lackawanna Steel Co., an important producer of rails and track fastenings, used its space for displaying products along these lines. The American Steel & Wire Co. showed various forms of wire and cable and the Midvale and Cambria companies exhibited their products.

To illustrate the properties of malleable iron in railroad use, the American Malleable Castings association used its space to demonstrate the lasting qualities of malleable iron, testing machines indicating its resistance to rough usage. The Bethlehem Steel Co. exhibited rails and accessories. The American Manganese Steel Co. demonstrated in its exhibit the qualities of manganese steel for rail points subjected to excessive wear. Accessories for tank and rolling stock also were shown by the National Malleable Castings Co. and the Chicago Malleable Castings Co.

A 10 per cent reduction in the wage scale of the Haskell & Barker Co., Michigan City, Ind., was announced March 15. The company, which makes railroad cars, employs 2500 men.

Sheet Operations

In Valley Continue To Increase—Steel Output Is Lower

Youngstown, O., March 22.—Independent open-hearth operation this week is at the rate of 33 1/3 per cent. Of the 51 open-hearth furnaces at independent steel plants, 17, or two less than one week ago, are being charged. The Trumbull Steel Co. is operating three, the Republic Iron & Steel Co. six, the Sharon Steel Hoop Co. two, and the Youngstown Sheet & Tube Co. six. The United States Steel Corp. has 10 active units, an increase of three units over last week's schedule.

With the resumption of eight mills at the sheet rolling department of the Youngstown Sheet & Tube Co., valley sheet mill operation at the start of this week was on the basis of 30 per cent, an increase of 7 per cent over that maintained a week ago. Other active sheet plants include the Trumbull Steel Co. with six mills, the Falcon Steel Co. with seven mills, the Newton Steel Co. with six mills and the Republic Iron & Steel Co. with six mills.

Of the 20 blast furnaces in the Mahoning valley owned by independent interests but six are in blast, five of which are classified as steelworks furnaces and one as a merchant stack. The Republic Iron & Steel Co., the Brier Hill Steel Co., the A. M. Byers Co., and the United Iron & Steel Co. are operating one stack each and the Youngstown Sheet & Tube Co., two. The Steel corporation banked a furnace of the Ohio group which leaves two of its seven stacks active in this district.

The Trumbull Steel Co. in addition to its sheet mills is operating 15 tin mills and its strip mills, the latter working the day turn only. The Republic Iron & Steel Co. also is operating five bar mills at its Brown Bonnell plant and two buttwelding pipe mills. Two lapwelding mills will be placed in action toward the middle of this week.

In a number of different directions a small resumption of steelworks activities is shown. The Central Steel Co., Massillon, O., has two open hearths in operation, the United Alloy Steel Corp., Canton, O., several openhearths, American Rolling Mill Co., Middletown, O., two furnaces, the Portsmouth plant of the Wheeling Steel Corp. three furnaces and the Ashland Iron & Mining Co., Ashland, Ky., has put on some capacity. Although the sheet mills of the Newport Rolling Mills resumed this week, the steelworks of the Andrews Steel Co., Newport, Ky., remains idle. Cold steel is being rolled. The plant of the Cleveland Steel Co., Cleveland, has resumed operations.

The Nonferrous Metals

Trading Dull and All Branches of Markets Uncertain—Copper Firmer—Zinc Use Light and Market Weak—Tin Quiet

	‡Copper	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel shot
March 16	11.87½	27.75	4.25	4.75	23.00	5.25	40.00
March 17	11.87½	28.00	4.25	4.75	23.00	5.25	40.00
March 18	11.87½	28.25	4.20	4.75	23.00	5.25	40.00
March 21	12.12½	28.50	4.25	4.70	23.00	5.25	40.00
March 22	12.25	28.25	4.25	4.70	23.00	5.25	40.00

‡Outside market, refinery.
†Open market quotation.

NEW YORK, March 22.—Nonferrous metal trading has shown little improvement and the markets remain in a state of uncertainty. Prices have been driven to levels below the general cost of production in all lines and the low prices have failed to stimulate consumption. Output has been cut sharply as a result of the unprofitable prices and the process of curtailment continues.

Production of zinc is at a rate of 20 to 25 per cent of smelting capacity and capacity is much smaller than it was in 1917. Consumption of zinc is similarly low. Brass mills are operating about 30 per cent of their 1920 production; sheet mills, whose galvanizing departments usually take upward of 60 per cent of the zinc produced, are operating at a low rate.

The independent sheet mills are estimated to be operating about 25 to 30 per cent. The leading sheet interest is operating 40 to 50 per cent, but as this interest operates its own zinc works it is a factor of little consequence in the general market. Zinc prices remain below cost, business being done in prime western the past few days at 4.70c, East St. Louis, for prompt and April shipment.

The situation in copper is similarly unsatisfactory. Large interests have reduced their operating rates to about 30 to 40 per cent, yet stocks have continued to accumulate. The situation is complicatd in that some interests produce copper from their own ores and are desirous of a stable market, while others buy on an average price basis, so that their principal aim is to sell for more than they have to pay. The latter class of sellers recently marked the quotation for refined copper down to 12c, delivered Connecticut valley, but late last week some of the low sellers withdrew from the market, and prices are firmer. Casting copper was offered down to 11.50c, refinery.

Lead has been firm, with continued fair consuming demand. Business has been done at varying prices, prompt and April shipments being sold at 4.22½c, New York. Some April delivery sold at 4.37½c, New York.

The tin trade is marking time in an extremely uncertain market. Practically no business is being done excepting for occasional trading among professionals, dealers and promoters. The Federated Malay States and the Netherlands government by agreement are not selling from their stocks of tin accumulated under the fixed price policy of recent months and their holdings of upwards of 20,000 tons continue a depressing factor. Far Eastern producers are doing a little business at prices in line with London. In New York futures are ¼c to ¾c higher than spot.

Mill products remain slow, with prices unchanged as follows, on quantity basis, mill deliveries, with some prices cut in competitive bidding:

Mill Products

SHEETS	
Copper, hot rolled, 24 oz., minimum	20.25-20.50
High brass	17.25
Zinc, ga. 9 to 18 plates ½c less)	11.00
Lead, full sheets (cut ¼c more)	7.50
SEAMLESS TUBES	
High brass	21.00
Copper	22.00
RODS	
High brass, round, ⅜ to 2½ in.	15.25
Naval brass rod	18.25
WIRE	
Copper	15.00
High brass	18.25

Dealers' buying prices on old metals follow:

Old Metals

HEAVY RED BRASS		
Chicago		8.50
Cleveland	9.00	9.50
New York	9.25	9.50
HEAVY YELLOW BRASS		
New York	5.75	6.00
Chicago		6.00
Cleveland	5.50	6.00
ZINC		
New York	2.75	3.00
Cleveland	2.75	3.00
Chicago		2.50

British Prices Continue Weak

Bottom Not Yet Reached in Iron Market, while Mills Make Further Revisions—Scotland Buys 10,000 Tons of Rails in Belgium, Argentina 10,000 Wheels in Germany—Four-Fifths of the Tin Plate Mills Idle

The Iron Trade Review Staff Cable

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LONDON, March 21.—Prices of British pig iron continue to weaken, following the drastic reductions made during the past few weeks, and the market remains dull. Thirty blast furnaces in the Cleveland district and 12 on the West coast are idle. Pig iron consumers in Scotland imported 16,000 tons of iron from Belgium last week. Meanwhile, the export market in the Cleveland district is lifeless. The customary coke standards have been abandoned.

Prices of structural shapes, plates, and billets were reduced in the past

Sterling—$3.92

week at a conference of the manufacturers in London. Belgian billets are being offered at £9 ($35.28) delivered in England, and Belgian finished steel at £12 ($47.04) delivered.

It is reported that a Glasgow firm has placed an order for 10,000 tons of Belgian rails at Antwerp at £7 ($27.44) below the British quotation. The Argentine state railways have ordered 10,000 tons of steel wheels from Krupp works, the latter obtaining the contract in competition with 14 British, German and American works. The Krupps' quotation was 49 pesos (normally $47.28) and the lowest competing quotation was 70 pesos (normally $67.54).

Steel scrap is unsalable in England, though offered at £3 10s ($13.71). Four-fifths of the British tin plate mills are idle. Heavy wage reductions are being demanded by employers in all branches of the iron and steel industry. Several already have been accepted by the men. Wages in the Midland district are still 265 per cent over the prewar level. A 50 per cent wage cut is demanded in South Wales.

The iron mills in Staffordshire are idle, due to the general lack of demand.

Price Cutting Fails To Start British Furnaces

European Staff Correspondence

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BIRMINGHAM, Eng., March 10.—A remarkable series of price reductions has been made in the British iron and steel market. The most important is a reduction of £2 5s ($8.73) in Cleveland iron, applying to all brands except hematite, the latter being reduced £2 ($7.76) per ton. This is the largest reduction ever effected in Cleveland, and it is all the more significant as it follows a cut made a few weeks ago. Ordinary No. 3 Cleveland iron now is £7 10s ($29.10) as compared with £11 5s ($43.65) at the end of last year. The new price of East coast hematite is £9 ($34.92) per ton. Scotch foundry iron has been further reduced 7 shillings 6 pence, ($1.46), while steel angles and joists have been cut to £16 12s 6d ($64.51).

The Cleveland trade has developed some unusual features. A good deal of pig iron has been brought in from abroad, and vessels after discharging have reloaded with Cleveland material for the continental port of departure. During the past month, Middlesborough has exported over 3000 tons of pig iron to Belgian ports.

Northampton and Darbyshire irons now will have to face severe competition from Cleveland, which since the beginning of the year has been

Sterling—$3.88

able to undersell Midland brands. The Midland smelters are not maintaining co-operative action with regard to prices, but are competing sharply against each other. Northampton forge material is being sold at £8 ($31.04), furnace, which while representing a severe cut in prices, still is substantially above the Cleveland quotation.

Smelters will be assisted by a reduction in coke, which was declared as the result of a meeting in Sheffield recently when cokemakers decided to put down the price of Yorkshire coke 10 shillings ($1.94) per ton, making the selling price £2 5s ($8.73), and £2 15s ($10.67) for export, both f. o. t., ovens.

In the Barrow district, only 10 furnaces now are in blast, as compared with 26 last autumn, and 31 during the war period. The United Steel Co., at Workington, proposes to damp down its furnaces.

A reduction of 2 shillings ($0.38) per day, taking effect from Feb. 26, was agreed to at a general meeting of miners and owners, to apply to the Cleveland iron ore mines.

The National Bar association, which comprises all the bar making districts, is making a strong effort to maintain united action. A fortnight ago it was confronted with the refusal of a number of the manufacturers in South Staffordshire to adhere to the selling price of £26 10s ($102.82). The firms definitely threw over the authority of the association, and invited orders at £24 10s ($95.06). It does not appear that any orders were received; but the association later practically capitulated to them and decided to make the general standard £24 10s. This figure is applicable to Yorkshire and Staffordshire, while the Lancashire basis was made £22 ($85.36), and that for the Northeast and Scotland £23 ($89.24). It is understood that these prices apply to iron for sale in the areas of production, the desire being to discourage competition between the districts. Nut and bolt iron was reduced to £22 ($85.36), but as the nut and bolt industry now is at a standstill as the result of a strike, there is no demand.

Marked bars have followed the reduction in common iron and have become £27 10s ($106.70), a fall of £2 ($7.76) per ton. The marked bar houses have a fair amount of business left over from their autumn contracts. With regard to nut and bolt material, the local makers have to compete against Belgian iron sold here at £14 ($54.32) per ton. A reduc-

Current Iron and Steel Prices of Europe

British Market

Corrected to Date by Cable

Home Market Prices. Gross Tons at Works or Furnace

	£	s	d	$
SEMIFINISHED STEEL				
Billets, soft steel	12	10	0	49.00
Sheet bars	12	10	0	49.00
Wire rods	16	15	0	65.66
FINISHED STEEL				
Steel bars, England, ½ to 3-inch	16	0	0	62.72
Ship plates, England	19	0	0	74.48
Ship plates, Scotland	19	0	0	74.48
Beams, England	17	10	0	68.60
Beams, Scotland	20	0	0	78.40
Sheets, black, 24 gage	21	0	0	82.32
Sheets, galvanized, 24 gage	24	10	0	96.04
Rails, 60-lbs. and over	18	0	0	69.76
Tin plate, base box, 108 lbs.	1	6	0	5.10
Steel hoops	20	0	0	78.40
PIG IRON*				
West Coast Hematite	9	0	0	35.28
Hematite, East Coast Mixed Numbers	9	0	0	35.28
Middlesborough, Basic	7	0	0	27.44
Middlesborough, No. 3	7	10	0	29.40
No. 3 Foundry, Derby, Leicester, Nottingham	8	10	0	33.32
No. 3 Foundry, Northamptonshire	7	10	0	29.36
No. 3 Foundry, Staffordshire	9	0	0	35.28
No. 3 Scotch Foundry	8	10	0	33.32
Ferromanganese 78 per cent	22	10	0	88.20
COKE				
Yorkshire furnace	2	5	0	8.82
Yorkshire foundry	3	0	0	11.76

*Pig iron quotations are f.o.b. furnace for delivery in the United Kingdom. Export prices generally are subject to free negotiations.

French Market

Prices Last Reported

	Francs per metric ton (2205 lbs.)	$
PIG IRON		
Hematite, Lorraine	625	37.50
Foundry, Longwy, No. 2, sand-cast	347	20.82
Foundry, Longwy, No. 2, chill-cast	380	22.80
Foundry, Longwy, No. 3, sand-cast	350	21.00
Foundry, Longwy, No. 3, chill-cast	350	21.00
COKE		
French furnace	135	8.10
German, Belgian and British furnace	135	8.10
SEMIFINISHED STEEL		
Blooms	745	44.70
Billets	745	44.70
Sheet bars	745	44.70
FINISHED STEEL		
	Francs per 100 kilos (220 lbs.)	$
Merchant bars	75	4.50
Angles	75	4.50
Normal beams and profiles	75	4.50
Plates, bridge and tank, 5 millimeters and thicker	105	6.30
Sheets, blue annealed, Ardennes	109	6.54
Bars, cold-drawn, 40 to 60 millimeters round	115	6.90

Pig iron prices, are f.o.b. cars at Longwy, Briey or Thionville, according to the schedule of the Comptoir des Fontes; semifinished steel prices, by the Comptoir Siderurgique de France, are delivered at principal consuming centers; finished prices, by the Paris Consortium, are delivered at Paris.

Belgian Market

Prices Last Reported

	Francs per metric ton (2205 lbs.)	$
PIG IRON		
Foundry, No. 2, Belgium	325	22.75
Foundry, No. 2, Luxemburg	350	24.50
Basic, open-hearth, Belgium	280 to 290	19.60 to 20.30
Basic-bessemer, Belgium	280 to 290	19.60 to 20.30
Basic-bessemer, Luxemburg	...	.....
SEMIFINISHED STEEL		
Blooms	425	29.75
Billets	425 to 435	29.75 to 30.45
Sheet bars	450	31.50
Wire rods	525	36.75
*Standard rails	600	42.00
FINISHED MATERIAL		
	Francs per 100 kilos (220 lbs.)	$
Merchant bars	47.50 to 50	3.33 to 3.50
Normal beams and profiles	52.50 to 55	3.68 to 3.85
Plates, 5 millimeters and thicker	67.50 to 70	4.73 to 4.90
Plates, 3 to 5 millimeters	70 to 72.50	4.90 to 5.08
Sheets, black, 3 millimeters	70 to 72.50	4.90 to 5.08
Plain wire	...	.....
Sheets, galv., 1 millimeter	190 to 195	13.30 to 13.65

*Sold on same basis as semifinished material.

All prices f.o.b. furnace or works, except finished material, for which delivered prices are quoted.

tion of £1 ($3.88) per ton has been made in skelp, which now is £26 ($100.88). This is generally considered inadequate, as iron skelp has to compete against steel produced quite satisfactorily, from Belgian billets and obtainable as low as £18 ($69.84) per ton.

Most of the Staffordshire forges and mills are idle, but many consumers, as well as warehouses, are in need of iron, and it is hoped that the new reductions will bring out a considerable amount of business.

The recent reductions in finished steel have been practically ineffective, and from all parts of the country there is news of idle steelworks. The steelworks of Bolckow Vaughan at Middlesborough, with the exception of one small department, have been closed down. Ebbw Vale is almost closed down, and several other large establishments are on the point of stopping.

Belgian competition continues to be formidable. Many British billets are being sold at about £13 ($50.44), and some steel lower, although the Welsh standard is £14 10s ($56.26). It is possible to buy Belgian billets delivered in Birmingham at £9 ($34.92), and in Scotland some fairly heavy purchases are being made at about the same prices.

One of the South Wales railways recently placed an order for 5000 tons of steel rails with Belgian manufacturers. The lowest quotation by Welsh mills was £18 ($69.84) and it was explained that the mills at this price would lose £2 ($7.76) per ton. The Belgian manufacturers, however, quoted £12 12s ($48.88) for delivery at a Welsh port, and the order therefore was placed abroad. The Taff Valley railway recently also placed an order in Belgium for rails at £12 12s 6d ($48.98).

A fair amount of business is being done at rerolling mills, solely through the use made of Belgian billets. Steel hoops and strip have been reduced £3 ($11.64) per ton, making the selling price £20 ($77.60).

Deep Cuts Fail To Move Welsh Tin Plate

European Special Correspondence

CARDIFF, South Wales, March 10. —The general opinion is that conditions in the Welsh steel and tin plate trades are going from bad to worse. Prices of tin plate continue to give way and the time is fast approaching when all the steel and tin plate works will be at a standstill, unless an improvement in buying sets in very soon.

Sterling—$3.88

Another attempt was made at a meeting of the trade recently to come to a final decision on the central sales agency plan. Promoters in a circular point out that the subscription to the proposed new company, the Welsh Tin Mills Co.,

Ltd., of £2000 ($7760) per mill is to be cut in half. Various reports are current as to the extent of the support promised, some putting it as high as 75 per cent of the total trade, and others that no more than about 56 per cent will join. The general view is that this attempt to revive the plan is doomed to failure. In this connection, a Copenhagen merchant, writing in reference to the scheme, declares that he knows for a fact that most consumers of tin plate in Denmark hold large stocks of tin plate and manufactured articles which cannot be sold for want of buyers.

In England there is almost a total absence of any general buying, and small parcels of tin plate that have changed hands, both on home and foreign account show a further cut in price of as much as 2 shillings ($0.40) per box. As low as £1 8s 6d ($5.62) per base box f.o.t. has been accepted, and it is reported that some remarkable low quotations have been taken for wasters, in one case 15 shillings ($3.00) having been accepted for a small quantity. Ternes are again easier at £3 ($11.64) f.o.t. works.

Production of Welsh tin plate in 1920 was 13,935,421 base boxes, compared with 12,386,326 in the previous year, and 8,806,272 in 1918. Deliveries from works last year amounted to 12,215,260 base boxes, against 11,039,966 in 1919 and 8,888,700 in 1918 according to official figures which were recently announced.

Current prices of tin plate are: Cokes, 20 x 14 £1 8s 6d to £1 12s 6d ($5.62 to $6.42); quarters, £1 12s 6d to £1 13s 6d ($6.42 to $6.62); 20 x 10, £2 4s 6d to £2 5s 6d ($8.74 to $8.94), 28 x 20, £2 17s to £3 5s ($11.24 to $12.76) and ternes 28 x 20, £3 1s to £3 3s ($11.96 to $12.36).

There is no change in galvanized sheets, notwithstanding that a good order recently was executed for India. The market is dull and makers have quoted 24-gage corrugated in bundles at £26 ($101.92) f.o.t., but sellers are offering at much below this figure. Flats are at £26 to £37 ($101.92 to $145) f.o.t. It is expected that sheet and tin bars will fall from £14 10s ($54.88). Only recently £3 ($11.64) per ton was taken off, but this has had no effect.

Germans Cut Price of Luxemburg Iron

European Special Correspondence

DUSSELDORF, March 10.—In view of offers of very low prices on pig iron which have been received from Luxemburg blast furnaces, the German pig iron syndicate at a recent meeting decided to reduce its prices for Luxemburg foundry pig iron by 130 marks per metric ton. The reduced prices for the different grades are as follows: No. 3, 1100 marks ($16.50); No. 4, 1085 marks ($16.27); and No. 5, 1070 marks ($16.05). All prices are on the basis of delivery at the station of Brebach near Saarbrucken. Prices for all other Luxemburg irons remain unchanged. For deliveries to the Upper Rhine, at such stations as Mannheim, Ludwigshafen, Frankfurt and Karlsruhe the prices for delivery of German pig iron have become somewhat lower, due solely to a reduction in Rhine freights.

The reductions in iron and steel prices which were generally expected in regard to deliveries after March 1, have not taken place. It has been decided to allow the prices of last

Mark—$0.015

November to remain unchanged. One reason is that there is no material change in the costs of production, while there is a general desire to await some clearing of the political situation. The pig iron prices which continue in effect in accordance with the decision of the pig iron committee of the steel federation are as follows: Hematite, 1910 marks ($28.65); foundry iron No. 1, 1660 marks ($24.90); foundry iron No. 3, 1659 marks ($24.88); basic, 1610 marks ($24.15) and spiegelesein, 1708 marks ($26.02).

Negotiations have taken place between the general association of the industries using tin plate, comprising some food canning trades, and tin plate makers as a result of which the latter have agreed to restore prewar quality, in the near future. A lowering of quality is said to have resulted in loss of export business.

There is great complaint of the quiet condition of the export markets for wire and wire products. The small improvement noted in November and December has disappeared, and scarcely any orders are coming from abroad. Inquiries from the border states are fairly numerous but they do not develop into contracts. A number of orders, however, have been placed by Finland for wire tacks. There is very keen competition in this departmment.

Interest centers on political matters. There is great anxiety over the peace conference, while the attitude of the United States is watched with keen interest. Another matter is the plebiscite in Upper Silesia, due to take place on March 20. It is believed trade will remain stagnant until the international questions are settled. The plebiscite in Upper Silesia is of vital consequence, and may decide Germany's industrial future. That district is one of the strongest centers of the German coal, iron and steel industry, and if Germany should lose Silesia it is feared she will retrogress to her industrial position of 25 years ago.

Czech Prices Down; Austrian Mounting

European Special Correspondence

VIENNA, Austria, March 10.—The Czecho-Slovak iron industry continues at a low rate of operation. Working time in the Freistadt steelworks, in the tube mills of Schonbrunn, and in a number of other plants, has been reduced. The Witkowitz works are fully occupied, producing entirely for stock purposes. The Silesian works, owing to their situation in the eastern portion of the country, are suffering severely through

Czech Crown—$0.01317

the closing of the Polish frontier.

Prices of raw materials are six to seven times higher than in 1917. Meantime, wages also have mounted rapidly, while the amount of work done is scarcely more than half that in the earlier period. German ironworks recently reduced prices 31 to 50 per cent, which effectually put the Austrian iron and steel industry out of real competition.

The government tax on blast furnace coke, in effect since April 1920, is to be abolished. As a result of this decision the Prager Eisenindustrie-Gesellschaft, the Witkowitzer and the Berg-und-Huttenwerks-Gesellschaft have reduced iron and steel prices 50 crowns ($0.66) per 100 kilos (220 pounds). The import duty of 1 per cent on foreign iron ores is to be reduced a half. The new prices per 100 kilos, f.o.b.

will be as shown in the table which follows:

	Crowns	
Foundry pig iron, No. 1	245	$3.22
Foundry pig iron, No. 3	243	3.20
Hematite	270	3.55
Ingots	300	3.95
Muck bars	360	4.47
Iron bars	400	5.26
Rolled wire	400	5.26
Girders	385	5.07
Rails, above 35 kilos per meter	390	5.13
Rails, 25 to 35 kilos per meter	395	5.20
Rails, below 25 kilos	400	5.26
Grooved rails	450	5.92
Band iron	445	5.86
Sheets, above 5 mill	480	6.32
Sheets, 3 to 5 mill	500	6.58
Sheets, 1 to 3 mill	510	6.71
Sheets, below 1 mill	520	6.84

A French syndicate is prepared to grant to Czecho-Slovak manufacturers a credit of 50,000,000 francs ($3,000,000) for raw materials, the period of the loan to be 18 months. It is to be refunded by the export of manufactured articles. Other offers of credit also have been received from England and France.

Further effort to solve the Austrian problem has been made in Paris, but there is a good deal of debate in Vienna as to whether it will end satisfactorily, in view of the fact that the United States is holding aloof. A suggestion emanating from France has been made in favor of the formation of an Austrian association by means of private capital with the cooperation of the governments of the United States, England, France, Italy, the neutral powers, and Austria. This private association would grant credits for raw materials to various industries.

Austrian Crown—$0.0015

It is remarkable that while iron prices are steadily falling in the surrounding states, in Austria they are continuing to rise. This is due to the steady increase in costs. Bar iron has reached the price of 2700 crowns ($4.05) per 100 kilos, open-hearth steel 3000 crowns ($4.50) and electric steel 5000 crowns ($7.50). These prices are 150 times higher than prewar figures. As late as the middle of last year they were only half the present figure. At the time of the breakdown in 1918 the cost of pig iron was from 35 to 48 crowns, yet today it is 2500 crowns ($3.75) per 100 kilos. But the limit has not yet been reached and further advances are impending.

A new increase in railway tariffs went in effect Feb. 15. Austrian tariffs now vary from 90 to 120 times more than at the outbreak of the war. Yet in Germany they are only six times more, and in Czechia 12 times. Tariffs on iron were raised 50 per cent, while those for coal remained unchanged.

Prospects for sales in Poland, Jugo-Slavia, and Roumania are decidedly improved. Czecho-Slovakia, however, is placing obstacles in the way of importations of Austrian machines, and it is quite possible that if the Czecho-Slovakian government enforces the prohibition of imports some retaliatory measures will be taken on behalf of the Austrian machinery industry.

Canada's Markets Dull; Plants Stay Busy

Special Correspondence

TORONTO, Ont., March 22.—The Canadian pig iron market has been exceptionally quiet this year as compared with 1920. Since the beginning of the year the demand for iron has been confined almost entirely to immediate requirements, and as foundries have been operating only to about 50 per cent of capacity, this has been in limited amount. Few contracts have been placed. Orders received by producers are seldom over carload lots. Despite the lull in demand, furnaces in Ontario with few exceptions have been blowing to capacity, but these are now finding it necessary to pile iron. There also are several electric furnaces in operation making pig iron from scrap. The prevailing prices on pig iron are: No. 1, (2.25 to 2.75 silicon) $39.14; malleable, $39.14; No. 2, (1.75 to 2.25 silicon) $38, Toronto. Montreal prices are approximately $2 per ton higher on account of additional freight charges.

Since the beginning of the present year there has been only a limited demand for finished steel in the Canadian market. Some mills carried over a heavy tonnage of unfilled orders from last year and have enough business on their books to enable them to keep their plants going to capacity.

During the past two or three weeks there has been little demand for structural shapes. Shapes are quoted by Canadian mills 3.50c to 3.55c, Toronto. Plates have been comparatively inactive for some weeks and mills are only finding a limited demand from the jobbers. Plates are quoted at 3.25c, Toronto. Steel bars have been in fair demand during the past few weeks, but orders are small compared with last year's business. Some of the provincial governments recently announced their intention of entering the market for supplies, and some of this business has been closed. Steel bars are quoted at 3.45c, Toronto. The demand for sheets has been small for some time past, but there appears to be a slight improvement with the jobbers. Producers, however, are beginning to find a better demand for sheets and while their sales are comparatively few, prospects for the future are much brighter. No. 28 black sheets are 5.95c and No. 28 galvanized, 7.65c, Toronto.

The scrap market has been exceptionally dull for several months, and while the demand might be said to be showing some improvement, dealers still report sales much below normal. For the past few weeks a slight improvement has been noted in the demand for heavy melting steel from the mills, but consumers are negotiating over prices with the dealers and consequently there is little business being done. Local dealers are paying $14 for heavy melting steel. A small demand is beginning to appear for No. 1 machinery cast, which is being purchased by dealers at $22.50. It is possible this figure will be reduced in keeping with the price of pig iron. Stove plate is being asked for but there is none on the market, and dealers are unable to accept orders. The price offered for stove plate is $23. No. 1 wrought scrap, rails and steel turnings ar moving in a limited way. Dealers are paying $12 for No. 1 wrought scrap; $15 for rails and $8 for steel turnings.

Australians To Spend Big Sum on New Works

Newcastle, N. S. W., Australia, March 8.—Nearly £6,000,000 is to be expended on new work in the Newcastle coal fields in the next few years. The developments include governmental and municipal undertakings and various private enterprises. The most important of the government's that have been authorized are: Extensive additions to the wharves of Newcastle and deepening the harbor.

The private industrial enterprises show that £1,500,000 has been provided by the Broken Hill Proprietary Co., for additional blast furnaces and open-hearth furnaces. The Australia Nail Co., is to construct 129 new coke ovens, duplicate its rod mill and build a galvanizing plant. Ryland Bros., of England, are to build a wire netting works. A. Gouinan & Co., are erecting large engineering works. The Ford Motor Car Co., has started a motor car factory near the Broken Hill steel works.

Steel Corporation Output High

Mill Production Averaged 88.3 Per Cent of Rated Capacity in 1920—Railroads' Tieup Prevented Better Record—Gross Business of $1,755,477,025 at New High Record—Exports 10.7 Per Cent of Shipments

NO reflection of the worldwide depression which overtook general business last year is to be found in the annual pamphlet report issued by the United States Steel Corp., for 1920, just made public. With mill output averaging 88.3 per cent of rated capacity for the entire 12 months, the gross volume of business of the corporation attained the new high record of $1,755,477,025. This was an increase of 21 per cent over the proceeding year. The previous high mark was the $1,744,312,163 gross of 1918. In 1919 the output was at the rate of 74.1 per cent of capacity. Only the demoralization of traffic facilities prevented mill operations from scoring nearly a 100 per cent record last year. During the four months from April to July, the worst of the railroad tangle, the output was reduced to 80 per cent. This lowered the average for the year considerably.

Statistics of Steel Corporation since Founding

Year	Gross receipts.	*Net earnings	Balance capital expenditures	Production steel ingots gross tons	Production fin. steel for sale net tons	Shipments finished products net tons	Number of employes
1920...	$1,755,477,025	$185,095,359	$102,956,133	19,277,960	14,228,502	14,098,707	267,345
1919..	1,448,557,834	152,290,639	87,091,514	17,200,373	11,997,935	12,243,183	252,106
1918..	1,744,312,168	208,281,104	129,855,037	19,583,493	13,849,493	14,124,985	268,710
1917..	1,683,962,552	304,161,471	117,977,117	20,285,061	14,942,911	15,370,105	268,058
1916..	1,231,473,779	333,574,177	64,680,648	20,910,589	15,460,792	15,542,088	252,608
1915..	726,683,589	130,396,011	15,537,431	16,376,492	11,762,639	10,982,748	191,126
1914..	558 414,933	71,663,615	28,171,013	11,826,476	9,014,512	9,078,559	179,353
1913..	796,894,299	137,121,844	41,999,098	16,656,361	12,374,838	12,168,758	228,906
1912..	745,505,515	108,174,673	13,780,361	16,901,223	12,506,619	12,696,935	221,025
1911..	615,148,839	104,305,466	49,430,851	12,753,370	9,476,248	9,450,169	196,888
1910..	703,961,424	101,054,754	53,101,221	14,179,369	10,733,995	10,727,751	218,435
1909..	646,382,251	131,491,414	37,916,250	13,355,189	9,859,660	9,691,290	195,500
1908..	482,367,840	91,847,710	49,422,697	7,838,713	6,206,832	7,102,456	165,211
1907..	757,014,767	160,964,078	66,981,252	13,099,548	10,376,742	10,451,488	210,180
1906..	696,756,926	156,624,273	32,155,146	13,511,149	10,578,433	10,862,425	202,457
1905..	535,331,736	110,787,653	24,395,408	11,995,239	9,226,386	.....	180,158
1904..	444,405,430	73,176,522	17,957,946	8,406,378	6,792,780	.....	147,343
1903..	536,572,871	100,171,152	31,042,135	9,167,960	7,635,690	.....	167,709
1902..	560,510,479	133,303,763	16,586,531	9,743,918	8,197,232	.....	168,127
1901..	.....	84,779,293	.....	8,854,820	.....	.....	.....

*After federal taxes.

Domestic Shipments Gain

The aggregate tonnage of all products, save cement, sold in 1920 by the corporation was 15,891,452 tons against 14,542,843 tons in the preceding year. Domestic shipments were 14,183,352 tons, a gain of 13 per cent over 1919. In contrast with this gain, export shipments dropped 12 per cent from the preceding year, the total being 1,708,100 tons. The ratio of exports to total shipments in 1920 was 10.7 per cent compared with the larger ratio of 14.2 per cent in 1919.

Production during 1920 gained sharply over the preceding year, but failed to attain the totals reached in 1918, 1917 and 1916. Ingot output was 19,277,960 tons against 17,200,373 tons in 1919. The corporation's high record was 20,910,589 tons in 1916. Production of finished steel for sale in 1920 was 14,228,502 tons, a considerable increase over the 11,997,935 tons in 1919. The record mark was established in 1916 with a total of 15,460,792 tons. The shipments of all classes of product last year compared with 1919, were as follows:

	1920 Tons	1919 Tons
Domestic		
Rolled steel and other finished products	12,453,243	10,310,729
Pig iron, ingots, spiegel, ferro and scrap	341,563	230,560
Iron ore, coal and coke	1,212,811	1,767,504
Sundry materials and by-products	175,735	167,044
Total tons all materials, except cement	14,183,352	12,475,837
Universal portland cement (barrels)	11,380,260	9,618,611
Export		
Rolled steel and other finished products	1,645,464	1,932,454
Pig iron, ingots and scrap	6,979	86,395
Sundry materials and by-products	55,657	48,157
Total tons all kinds of materials	1,708,100	2,067,006
Aggregate tonnage of all products shipped to domestic and export trade	14,098,707	12,243,183

TOTAL VALUE OF BUSINESS (covering all of shipments, including cement and completed steamships delivered and other business not measured by the ton unit)	1920	1919
Domestic (not including inter-company sales)	$1,071,739,500	$ 909,081,769
Export	147,905,404	165,167,876
Totals	$1,219,644,904	$1,074,249,645

An increase of $31,566,818 is shown in inventories over one year before. Unlike many other steel companies the corporation did not have to make provision for inventory shrinkage. The net book valuation of ininventories, after deducting $95,000,000 for account of actual cost or market value of the stocks in excess of unit prices as of Dec. 31, 1915, was $258,363,497.

Total expenditures made during the year for repairs, maintenance and general upkeep of the properties, including expenditures made on subsidiary railroads under operation by the United States railroad administration, were $153,225,958 in 1920 against $131,476,797 in 1919. This was an increase of 16.54 per cent over 1919.

Capital Outlay Is Large

During 1920 the corporation and its subsidiaries expended $102,956,133 for the acquisition of additional properties, extensions and construction, and net stripping and development expenses at mines. Expenditure for manufacturing properties totaled $37,677,329 and for ocean steamers $22,853,531. An item of $5,448,140 is reported for housing facilities for employes. Of the total capital outlay the sum of $27,000,000 was charged to income for the year, representing an allowance for extraordinary cost due to conditions resulting from the world war. In the four years ending Dec. 31, 1920, the aggregate amount absorbed in earnings and income for extraordinary cost of construction has been $147,297,854.

Some of the most important additions and improvements made during 1920 include enlargement of the Faithfield plant of the Tennessee Coal, Iron & Railroad Co., and progress in the construction of the new rod and wire mill at the Duluth plant of the Minnesota Steel Co., which it is hoped to complete in 1921. In addition, the corporation, in December, purchased at a cost of $4,413,285 the Morra da Mina Manganese ore property located in Brazil.

Expansion of railroad facilities was

PRODUCTION

OF

RAW, SEMI-FINISHED AND FINISHED PRODUCTS BY SUBSIDIARY COMPANIES IN THE YEAR 1920 COMPARED WITH THE YEAR 1919

PRODUCTS	1920	1919
IRON ORE MINED		
In the Lake Superior Region	*Tons*	*Tons*
Missabe and Vermilion Ranges	20 875 695	19 400 891
Gogebic, Menominee and Marquette Ranges	3 587 937	3 585 259
In the Southern Region		
Tennessee Coal, Iron & R. R. Co.'s Mines	2 557 377	2 436 943
Total	27 021 009	25 423 093
LIMESTONE QUARRIED	5 981 022	5 835 289
COAL MINED		
For use in the manufacture of coke	24 384 925	22 955 636
For steam, gas and all other purposes	6 443 409	5 937 487
Total	30 828 334	28 893 123
COKE MANUFACTURED		
In Bee-Hive Ovens	6 125 032	5 933 056
In By-Product Ovens	10 083 079	9 530 593
Total	16 208 111	15 463 649
BLAST FURNACE PRODUCTION		
Pig Iron	14 352 617	13 481 738
Spiegel, Ferromanganese and Ferrosilicon	180 029	155 766
Total	14 532 646	13 637 504
STEEL INGOT PRODUCTION		
Bessemer Ingots	5 402 897	4 788 242
Open Hearth Ingots	13 875 063	12 412 131
Total	19 277 960	17 200 373
ROLLED AND OTHER FINISHED STEEL PRODUCTS FOR SALE		
Steel Rails (Heavy and Light Tee and Girder)	1 490 616	1 361 358
Blooms, Billets, Slabs, Sheet and Tinplate Bars	1 023 762	975 020
Plates	1 739 263	1 578 360
Heavy Structural Shapes	1 040 619	855 118
Merchant Bars, Hoops, Skelp, Light Shapes, Etc.	2 846 686	2 270 711
Tubing and Pipe	1 429 691	1 192 582
Wire Rods	254 968	161 053
Wire and Wire Products	1 757 141	1 438 439
Sheets (Black and Galvanized) and Tinplates	1 610 531	1 381 515
Finished Structural Work	416 469	351 704
Angle Splice Bars and All Other Rail Joints	235 913	188 707
Spikes, Bolts, Nuts and Rivets	93 461	39 009
Axles	97 145	75 494
Steel Car Wheels	73 819	30 946
Sundry Steel and Iron Products	98 415	91 919
Total	14 228 502	11 997 935
MISCELLANEOUS PRODUCTS		
Zinc	63 077	45 949
Sulphate of Iron	40 291	35 197
Fertilizer-"Duplex Basic Phosphate"	14 683	24 450
Fertilizer-Sulphate of Ammonia	133 798	130 210
Ammonia (as Liquor)	5 393	2 313
Benzol Products	119 109	107 549
	Bbls.	*Bbls.*
Universal Portland Cement	11 960 000	9 112 000

one important phase of development in 1920. Thirty-four locomotives and 1069 freight and service cars were purchased at a cost of $4,500,040, while the manufacturing and coal companies added six locomotives and 1128 cars costing $4,292,333.

The only wage increase for iron and steel employes during the year was the 10 per cent of Feb. 1, 1920, which brought wages of common labor to 144 per cent above the rate in effect in 1915. A 15 per cent raise for coal miners became effective last summer, while on May 1, railroad employes received an increase of 20 per cent. The following is a condensed comparative statement of labor statistics for the corporation during 1920 and 1919:

Employes of	1920 *Number*	1919 *Number*
Manufacturing properties	200,991	188,550
Coal and coke properties	25,889	24,595
Iron ore properties	11,517	12,425
*Transportation properties	24,643	23,132
Miscellaneous properties	4,305	3,404
Total	267,345	252,106
Total salaries and wages paid	$581,556,925	$479,548,040
Average earnings per employe per day during 1920:		
All employes, exclusive of general administrative and selling force	$6.96	$6.12
Total employes, including general adminstrative and selling force	$7.00	$6.17

*Includes employes of subsidiary railroads which were under federal control.

In connection with export trade, $22,853,631 were spent for 27 ocean cargo steamers. During the year 16 of the steamers were put in operation.

For the month of October, the average rate was $7.23 per day and for December it was $7.19 per day. During the year, $779,766 were distributed in pensions and 2969 names were on the list.

The balance sheet shows some interesting changes from the preceding year. The current assets of $702,370,464 compare with $672,295,388 one year before. In addition to the increased inventories, accounts and bills receivable gained $50,293,161 to a total of $149,400,000. Decreases are shown in the cash account of $43,065,850 to a total of $123,000,000 in marketable securities of $8,719,054 to a total of $150,350,616. The net working capital advanced $26,423,443 as of Dec. 31, to a total of $545,625,000.

Net earnings for 1920 after federal income and excess profits taxes of $37,500,000 amounted to $185,095,359,000 against $152,290,639 in 1919 after federal taxes of $52,000,000. In 1919 a net of $208,281,104 and federal taxes aggregating $274,277,834 was reported.

In his statement to stockholders, Chairman E. H. Gary gave no hint to the corporation's future price or wage policy. Discussing the situation, Judge Gary says in part:

"The demand for iron and steel products during the first seven months

COMPARATIVE INCOME ACCOUNT

For the Fiscal Years ending December 31, 1920 and 1919

	1920	1919	+Increase —Decrease
EARNINGS—Before charging interest on Bonds and Mortgages of Subsidiary Companies:			
First Quarter	$44 212 019 49	$35 729 326 96	+ $8 482 692 53
Second Quarter	45 268 551 34	36 520 341 16	+ 8 748 210 18
Third Quarter	50 145 301 18	42 327 714 20	+ 7 817 586 98
Fourth Quarter	45 469 487 27	37 713 256 92	+ 7 756 230 35
Total for year	*$185 095 359 28	*$152 290 639 21	+ $32 804 720 04
Less, Interest on outstanding Bonds and Mortgages of the Subsidiary Companies	8 408 460 87	8 701 576 72	— 293 115 85
Balance of Earnings	$176 686 898 41	$143 589 062 52	+ $33 097 835 89
Less, Charges and Allowances for Depletion and Depreciation applied as follows, viz.:			
To Depreciation and Replacement Funds and Sinking Funds on Bonds of Subsidiary Companies	38 245 601 92	37 608 819 42	+ 636 782 50
To Sinking Funds on U. S. Steel Corporation Bonds	8 438 762 40	7 937 107 01	+ 501 655 39
Net Income in the year	$130 002 534 09	$98 043 136 09	+ $31 959 398 00
Deduct:			
Interest on U. S. Steel Corporation Bonds outstanding	20 105 599 58	20 509 320 85	— 403 761 27
Premium paid on Bonds redeemed, viz.:			
On Subsidiary Companies' Bonds	118 104 19	119 032 43	— 928 24
On U. S. Steel Corporation Bonds	717 228 41	814 418 93	— 97 190 44
Balance	$109 061 641 83	$76 600 363 88	+ $32 461 277 95
Add: Net Balance of sundry charges and credits, including adjustments of various accounts	632 585 81	194 218 67	+ 438 367 14
	$109 694 227 64	$76 794 582 55	+ $32 899 645 09
Dividends on U. S. Steel Corporation Stocks, viz.:			
Preferred, 7%	25 219 677 00	25 219 677 00	
Common, 5%	25 415 125 00	25 415 125 00	
Surplus Net Income	$59 059 425 64	$26 159 780 55	+ $32 899 645 09
Less, Appropriated from Surplus Net Income on account of expenditures made on authorized appropriations for additional property and construction	30 000 000 00		+ 30 000 000 00
Balance carried to Undivided Surplus	$29 059 425 64	$26 159 780 55	+ $2 899 645 09

*Balance of Earnings after making allowances for estimated amount of Federal income and excess profits taxes.

for the year was large, the new business booked from month to month materially exceeding capacity. Beginning with August there was a slackening in the volume of orders offering. The new business accepted during the year with the considerable tonnage carried over from 1919 enabled the properties of the subsidiary companies to operate to very near the full capacity except as operations were interfered with, especially from April to July, inclusive, because of inadequate railroad service.

"No change was made during the year in domestic prices for the principal steel products which were in accordance with the schedule announced by the industrial board of the department of commerce on March 21, 1919. The price policy adhered to, despite the fact that high prices could have been obtained, enabled the corporation to maintain operations and also to carry forward to 1921 a large tonnage of unfilled orders, and to net considerable profits, despite increased costs from higher freight rates, wages, raw materials and fuel."

1920 Pig Iron Production Shows Gain

DURING 1920, the production of pig iron in the United States totaled 36,925,987 gross tons, according to official figures compiled by the American Iron and Steel institute. The output in 1920 showed an improvement of 5,910,623 tons over the 31,015,364 tons of 1919, but was less than the 1918 output of 39,054,644 tons by 2,128,657 tons. Of the 1920 output, 16,737,722 tons were basic iron; 12,062,084 tons bessemer; 5,957,782 tons foundry; 1,310,951 tons malleable; 318,048 tons forge; and 539,400 tons other grades. During the first half of the year, 18,435,602 tons were produced and during the second half, 18,490,385 tons, a gain of 54,783 tons for the latter six months.

Of the total production, 26,201,689 tons were made for makers' own use, while the balance of 10,724,298 tons were made for sale. This represents a proportion of 71 per cent nonmerchant and 29 per cent merchant. This ratio is practically the same as for 1919 when the percentages were 72 and 28 per cent respectively.

Upon the basis of fuel used in production, 36,300,024 tons were made by coke, including ferroalloys made with electricity; 302,567 tons were made by anthracite, including mixed anthracite and coke pig iron; and 323,396 tons were made by charcoal. Pig iron made by coke represented 98.4 per cent of the total as was also the case in 1919.

The figures of the institute show that of the 323,396 tons of charcoal iron, 1734 tons were made by the cold blast method and 321,662 tons by the hot and warm blast methods. A slightly greater proportion was made by the latter methods in 1920 than in 1919. Ferromanganese and spiegeleisen production totaled 406,896 tons, of which 295,447 tons were ferromanganese and 111,449 tons spiegeleisen.

On June 30, there were 322 stacks in blast while on Dec. 31, only 216 out of 452 were active. Therefore, at the close of the year only 48 per cent of the furnaces in the country were in blast. At the end of 1919, 280 out of 453 were in blast, representing 61.8 per cent of capacity.

In the accompanying tables are shown pig iron statistics for 1920 classified as to merchant and nonmerchant output and fuel used. The production of cold and hot blast charcoal iron from 1916 to 1920 is given as is production by grades from 1905 to 1920.

PRODUCTION OF COLD AND HOT AND WARM BLAST CHARCOAL PIG IRON, 1916–1920.

Kinds of iron.	1916.	1917.	1918.	1919.	1920.
Cold blast	5,323	5,219	4,209	2,113	1,734
Hot and warm blast	367,088	371,306	344,668	324,984	321,662
Total.....Gross tons.	372,411	*376,525	*348,877	327,097	323,396

* Includes small tonnage made with charcoal and coke mixed in 1917 and 1918.

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

	Blast furnaces.				Production—Gross tons. (Includes spiegeleisen, ferro-mang., ferro-silicon, ferro-phosphorus, etc.)		
	In blast June 30, 1920.	December 31, 1920. In.	Out.	Total.	First half of 1920.	Second half of 1920.	Total. 1920.
Coke*	297	201	208	409	18,133,611	18,166,413	36,300,024
Anthracite†	9	2	9	11	146,379	156,188	302,567
Charcoal	16	13	19	32	155,612	167,784	323,396
Total	322	216	236	452	18,435,602	18,490,385	36,925,987

* Includes ferro-alloys made with electricity, electricity and coke, etc.
† Includes mixed anthracite and coke pig iron.

PIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN 1920.

Grades.	For sale.	For maker's use.	Total. Gross tons.
Basic	2,150,523	14,587,199	16,737,722
Bessemer and low-phosphorus	1,094,256	10,967,828	12,062,084
Foundry, including ferro-silicon	5,760,822	196,960	5,957,782
Malleable	1,284,491	26,460	1,310,951
Forge or mill	151,999	166,049	318,048
Ferro-manganese	133,766	161,681	295,447
Spiegeleisen	72,371	39,078	111,449
All other grades	76,070	56,434	132,504
Total.....Gross tons.	10,724,298	26,201,689	36,925,987

PRODUCTION OF PIG IRON BY GRADES, 1905–1920.

Years	Basic.	Bessemer.	Foundry.	Malleable.	Forge.	All other.	Total. Gross tons.
1905.	4,105,179	12,407,116	4,758,038	635,236	727,817	358,994	22,992,380
1906.	5,018,674	13,840,518	4,773,011	699,701	597,420	377,867	25,307,191
1907.	5,375,219	13,231,620	5,151,209	920,290	683,167	419,856	25,781,361
1908.	4,010,144	7,216,976	3,637,622	414,957	457,164	199,155	15,936,018
1909.	8,250,225	10,557,370	5,322,415	658,048	725,624	281,789	25,795,471
1910.	9,084,608	11,245,642	5,260,447	843,123	564,157	305,590	27,303,567
1911.	8,520,020	9,409,303	4,468,940	612,533	408,841	229,910	23,649,547
1912.	11,417,886	11,664,015	5,073,873	825,643	469,183	276,337	29,726,937
1913.	12,536,693	11,590,113	5,220,343	993,736	324,407	300,860	30,966,152
1914.	9,670,687	7,859,127	4,533,254	671,771	361,651	235,754	23,332,244
1915.	13,093,214	10,523,306	4,843,899	829,921	316,214	309,659	29,916,213
1916.	17,684,087	14,422,457	5,553,644	921,486	348,344	504,779	39,434,797
1917.	17,671,662	13,714,732	5,328,258	1,015,579	345,707	545,278	38,621,216
1918.	18,646,174	13,024,966	5,145,260	1,117,914	393,932	726,398	39,054,644
1919.	14,494,131	9,975,934	4,916,758	1,009,049	271,286	348,206	31,015,364
1920.	16,737,722	12,062,084	5,957,782	1,310,951	318,048	539,400	36,925,987

Price Relationships Returning

More Normal Balance Between Commodity Values Necessary to Business Recovery—Study Shows Declines of Steel Products Approximate Wheat's Drop—Purchasing Power of Pig Iron in Farm Products Over 16 Years Reveals Trend

BY JOHN W. HILL

MOST leading economists maintain that business revival hinges largely upon the leveling of wages and prices to a new basis. The downward transition of values starting with last year's violent declines, has thrown many commodities out of line with production costs and with other commodities as well. As a result, the purchasing power of various important classes of producers has been depleted and until it is repaired and costs are stabilized readjustment processes are likely to continue at work.

Industrial equilibrium involves the reestablishment of normal price relationships between commodities. This does not mean that prewar relationships in all cases must return but that the prices of all commodities must bear the same ratio to their respective production costs.

While the price picture continues considerably confused, one of the most encouraging signs of the present is the unmistakable trend toward more normal price relationships between important industries. Nowhere is this tendency more in evidence than between the great basic enterprises of iron and steel and agriculture.

Prices in these industries, with certain striking exceptions, are maintaining a singularly even pace in the deflationary process. As shown by Table I, wheat, the leading farm product, has declined 47 per cent from the peak reached in 1920. The drop of pig iron has been 46 per cent; of open-hearth billets, 45 per cent; of black sheets 42 per cent; and of steel bars 48 per cent. At present cash prices wheat stands 80 per cent above the average price for the year 1913. Pig iron is only 73.6 per cent above the 1913 average; billets are 50.6 per cent above; black sheets, 97.8 per cent above; steel bars 44.6 per cent above; and shapes, 70.6 per cent above. The relatively high price in sheets is due in a considerable measure to the labor factor.

Where Will New Level Be?

Many students of business are endeavoring to forecast the probable location of the next general price plateau with respect to the prewar level. The price index, consisting largely of raw materials, of one commercial agency is now 27 per cent above the 1913 basis.

While it is impossible to forecast the probable future normal level of prices it is interesting to study the price history of leading commodities over a series of years. A study of prices of seven commodities including pig iron, hogs, wool, cotton, sugar, wheat, corn, shows that out of this list, the quotations of three are below the average for 16 years. These are wool, cotton and corn. Prices for pig iron, hogs, sugar, and wheat are averaging higher than the 16 year average, as shown by Table II. Where prices have been excessively depressed, rebounds are probable, while at the same time other prices may see further deflation.

Will Influence Quotations

The 16-year average of prices includes the abnormal war and post war years and consequently the mean is higher than an average of prewar years exclusively. Some students point out, however, that the average including the factor of war inflation is more reliable as an indication of a probable normal level for commodities than is a purely prewar mean. This is true because certain elements of inflated cost inherited from the war will continue to influence commodity quotations for many years.

The basic cost in production is the price of a day's labor. While wage reductions are being put into effect in many industries, there is no indication that prewar levels will be reached. This has never happened following any previous war. In addition the factor of taxation and freight charges will remain to be reckoned with for an indefinite period. It is estimated that for years the annual tax burden will amount to at least $4,000,000,000 against a peak of $1,000,000,000 before the war. These taxes must come out of incomes and profits and must be figured in some manner into prices. Freight rates are 90 per cent above prewar levels and give every promise of giving ground very slowly.

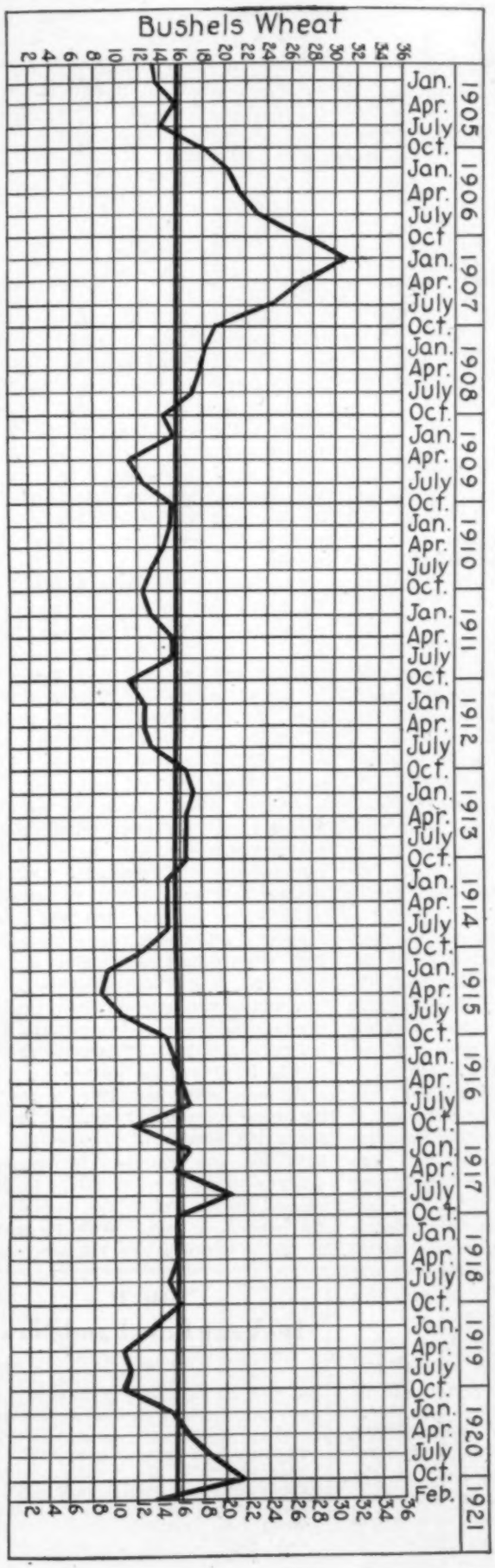
The freight on raw materials of iron and steel manufacture today represent an increase of 120 per cent over the prewar period. This will prove a leading consideration in the steel industry where tonnage hauls plays so important a part in costs.

The downward movement of prices of the present crisis has been unprecedentedly severe but the worst of the descent evidently is over. As measured by various commodity price index numbers the most extended declines came in November and December. The months of January and February indicated that the curve of commodity values is moving lower much less violently. The level of wholesale prices as determined by the bureau of labor statistics was 77 per cent above the prewar basis at the beginning of February. This meant that the dollar had a purchasing power at wholesale of 56 cents compared with 1913.

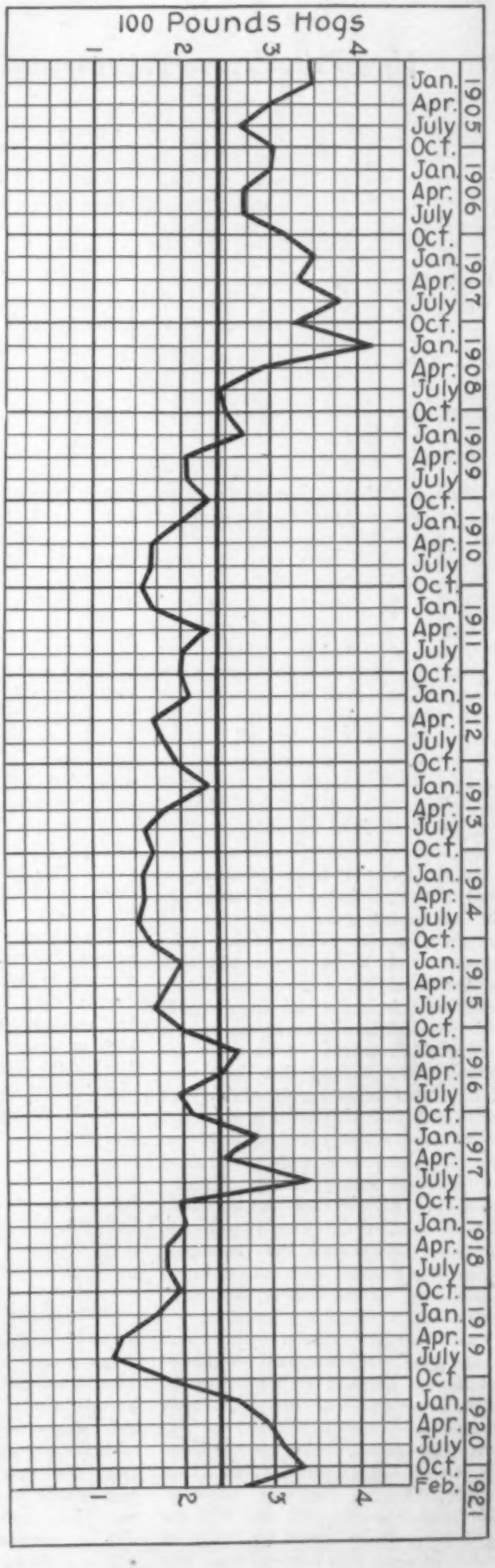
On March 1, Dun's weighted index number of wholesale prices was 50 per cent above 1913. The drop of this index in February was only 2.1 per cent against monthly declines of around 6 per cent for some months previously. This number now stands about 28 per cent below that reached last May. In previous periods of readjustment price falls have continued for an average of about 15 months. Bradstreet's index largely made up of raw materials which fluctuate more violently than other prices was 27 per cent above 1913 on March 1, and has been dropping for 12 months. Dun's index number has continued downward uninterruptedly since last May. Based on past experience many economists conclude that while the deflation of prices is apparently slackening in some quarters, no indication appears that the readjustment as a whole has been completed. One authority maintains that the price tendency will continue downward for 10 years or more, as it did after the civil war.

Some Products In Balance

The fact that prewar price ratios are returning in some important products of the iron and steel and agricultural industries is established by a study embracing the purchasing power of basic or steelmaking pig iron delivered in Pittsburgh in terms of wheat, wool, cotton and hogs, over a period of 16 years. As shown by the accompanying charts the exchange value of pig iron compared with these com-



FLUCTUATIONS OF THE PURCHASING POWER OF 1 TON OF PIG IRON IN BUSHELS OF WHEAT OVER A PERIOD OF 16 YEARS ARE SHOWN BY THE CURVE OF THE CHART. THE STRAIGHT BLACK LINE AT THE LEVEL OF 15.8 BUSHELS REPRESENTS THE AVERAGE NUMBER OF BUSHELS OF WHEAT COMMANDED BY A TON OF IRON FOR THE ENTIRE PERIOD



FLUCTUATIONS OF THE PURCHASING POWER OF 1 TON OF PIG IRON IN POUNDS OF HOGS OVER A PERIOD OF 16 YEARS ARE SHOWN BY THE CURVE OF THE CHART. THE STRAIGHT BLACK LINE AT THE LEVEL OF 240 POUNDS REPRESENTS THE AVERAGE NUMBER OF POUNDS OF HOGS COMMANDED BY A TON OF IRON FOR THE ENTIRE PERIOD

Table I

How Prices Have Fluctuated since 1913

	Average price 1913	Quotations March 1921	Percentage change from 1913	*High for 1920	Per cent gain at peak over 1913	Per cent drop of March quotations from peak
AGRICULTURAL PRODUCTS						
Wheat (bushels)	$ .95	$ 1.71	+80	$ 3.25	242	47
Corn (bushels)	.62	.68	+ 9.6	2.03	230	66
Hogs (100 lbs.)	8.34	10.00	+19.9	21.98	163	54.5
Sugar (100 lbs.)	4.22	8.00	+89.5	23.00	469	65.2
Cotton (lbs.)	.127	.1155	— 9.4	.43	238	73
IRON AND STEEL PRODUCTS						
Pig iron	15.53	26.96	+73.6	49.96	221	46
Billets (open-hearth)	25.56	38.50	+50.6	70.00	173	45
Black sheets	44.48	80.00	+97.8	140.00	214	42
Steel bars	27.66	40.00	+44.6	77.00	175	48
Structural shapes	28.72	49.00	+70.6	65.00	126	24

*Average monthly price.

modities was thrown out of line during the war to the disadvantage of pig iron. In 1920 when pig iron was advancing, while farm products were deflating, the balance was again disturbed to the advantage of the purchasing power of iron. Recent declines in pig iron prices, however, are tending to cause the exchange value to swing back to normal again, save in the cases of wool and cotton, where special circumstances prevail. Hogs and wheat, two food necessaries, are resuming their normal price ratio with pig iron because neither has suffered the violent declines which have overtaken cotton and wool.

During the war huge quantities of wool were purchased and stored by the belligerent governments for use by their armies. This caused price inflation and an apparent shortage. In the meantime large quantities of wool were being stored in Australia with no ships available to carry it to the world markets. Last year the statistical fact dawned that there were at least two years supply of wool on hands with new clips coming on. As a result wool prices have fallen 76 per cent from the war peak, and many wool growers actually unable to find a reasonable market are storing their clip on the farms. The British and American governments have attempted to let the market down as easily as possible by feeding surplus stocks to consumers at regulated auctions.

This situation explains why a ton of pig iron will command an abnormal amount of wool at present prices. Previous to the war the price ratio between wool and pig iron was exceptionally constant. The normal average was 33 pounds of wool to a ton of iron. During the war, however, wool soared and in 1918 and 1919 the pig iron producer could buy only 25 pounds of wool with a ton of iron. The violent slump of wool last year was not shared by iron, however. Although pig iron has dropped wool continues to fall further bringing the price ratio up to nearly 90 as of March this year.

Cotton Shows Erratic Course

Cotton has had a fluctuating price history not only in the last few years, but during prewar years as well. This is due, largely to the fact that since a large share of the crop is exported, quotations are extremely sensitive to world conditions. Its price relationship with pig iron has been variable. The average for the past 16 years is 130 pounds to the ton of pig iron. Seldom has this normal line been touched, however.

The chart clearly pictures the pronounced advance in cotton prices beginning in 1918 and ending with the drastic drop of 1920. The deflation has amounted to 73 per cent from the high water mark of 43 cents a pound. During the war cotton was subject to speculation and inflation and was much in demand for war purposes. It was not under price control the same as pig iron and hogs and this fact may have had an influence upon its violent fluctuation. At one time high officials in the American government expressed the fear that the threatened exhaustion of cotton supplies was one of the most menacing problems confronting the belligerents.

The worldwide slump in business caught cotton at its peak. Foreign and American mills closed down, Central Europe could not finance purchases and today a holdover of from 9,000,000 to 12,000,000 pounds of cotton is forecast this year. With half of the crop unsold southern planters are having loans called before new credit will be extended for this year's crop.

This explains why cotton has slumped to below prewar levels, and may mean a substantial reduction of cotton acreage this year. In contrast with the normal purchasing power of 139 pounds for a ton of pig iron, the latter now will purchase more than 225 pounds. It is singular that this ratio has not been seen since January of 1905 when cotton sold for the low price of 7 cents and pig iron was $16.15 a ton.

More normal pictures are presented by wheat and hogs. Over the 16 years considered pig iron has commanded an average of 15.8 bushels of wheat. This ratio was approximated from 1908 to 1914, years that may be regarded as normal. In 1907 when pig iron was selling at the high price of $22.90 a ton, wheat was quoted at 72 cents a bushel and a ton of iron was worth 31.5 bushels of wheat. Before the year ended, however, pig iron had declined and wheat advanced and the ratio was brought back nearly to normal.

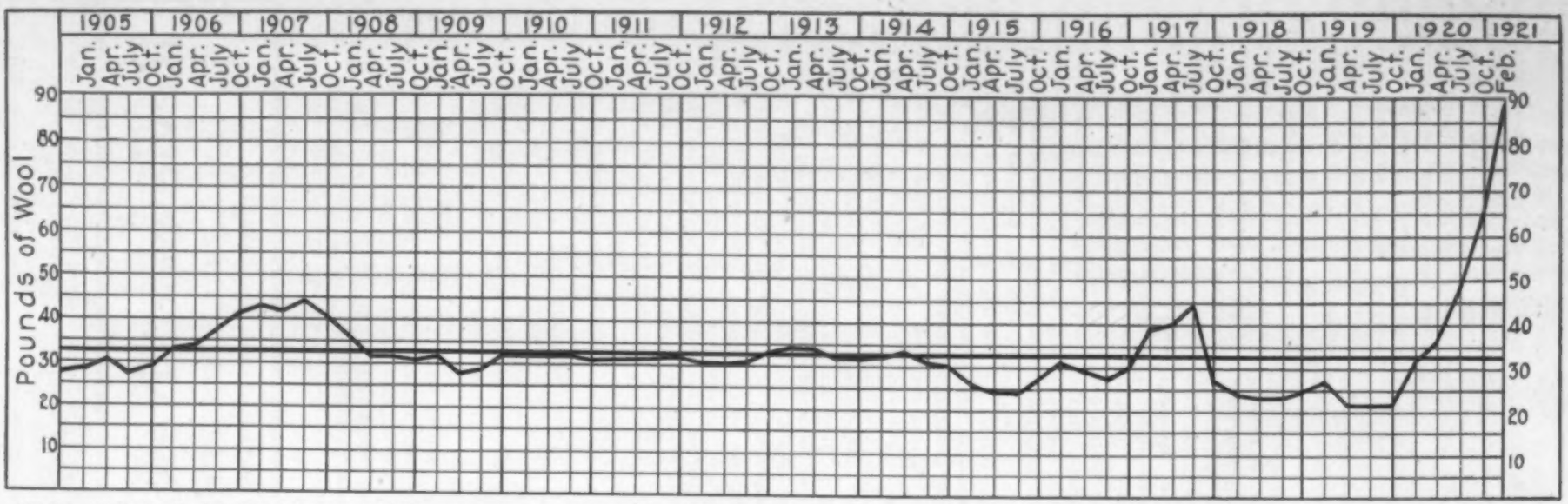
The year 1915 brought Europe's cry for bread and by April of that year wheat was quoted at $1.58 a bushel, while pig iron was feeling the war depression and had sunk to $12.50 a ton in the Mahoning and Shenango Valleys. At that period only 8.5 bushels of wheat could be obtained for a ton of iron, the lowest ratio for many years. That the regulation of iron and wheat prices during the war had regard to the old price relationship is evident from the fact that the ratio throughout 1918 remained at 15.8 bushels. Wheat started up in 1919 while iron declined and the ratio dropped. The tables were turned in 1920 when wheat was falling as iron ascended. Recent fluctuations of both iron and wheat, however, have brought the ratio somewhat below normal. This indicates a relatively larger deflation in pig iron than in wheat.

Between 1909 and 1915 a ton of pig iron commanded an average of about 150 pounds of hogs. This relationship was disturbed by the sudden rise of pig iron in 1917. In July of that year a ton of iron would buy 350 pounds of hogs. With the fixing of the iron prices and the soaring of

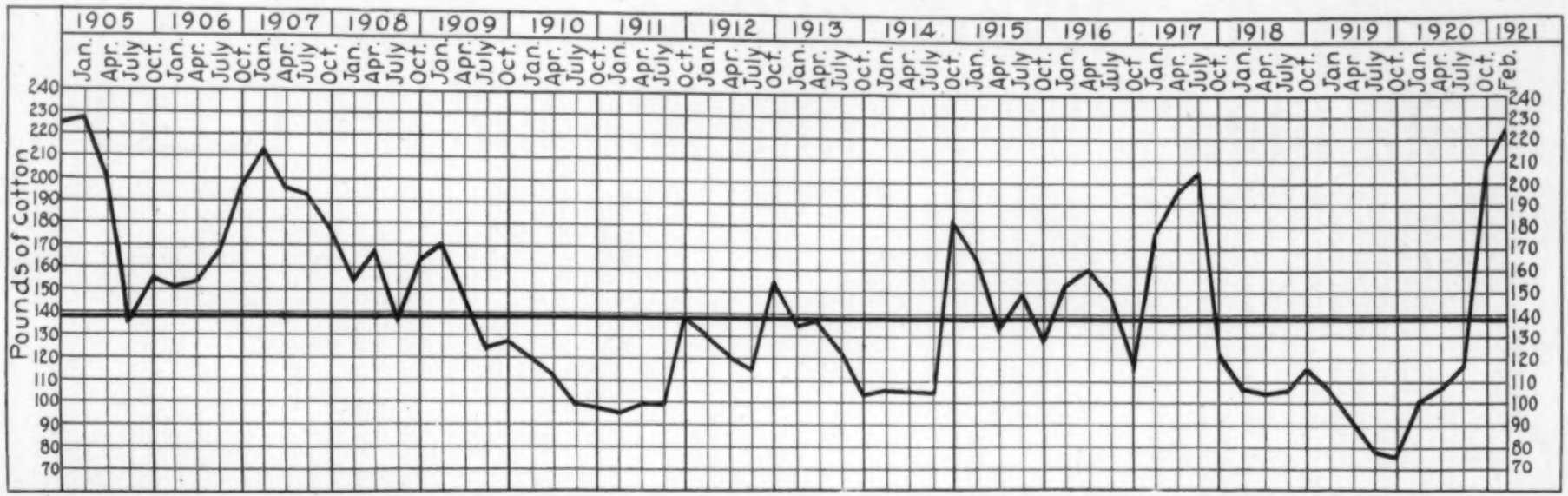
Table II

16-Year Level and Now

	Average price 16 years (1905-1920)	March quot'ns	Per cent change from 16-year average
Pig iron (ton)	$20.61	$25.00	+21.3
Hogs (100 lbs.)	8.75	10.00	+14.3
Wool (lb.)	.676	.32	—52.6
Cotton (lb.)	.1643	.1155	—29
Sugar (100 lbs.)	6.30	8.00	+26.9
Wheat (bu.)	1.36	1.71	+25.7
Corn (bu.)	.85	.68	—20



FLUCTUATIONS OF THE PURCHASING POWER OF 1 TON OF PIG IRON IN POUNDS OF WOOL OVER A PERIOD OF 16 YEARS ARE SHOWN BY THE CURVE OF THE CHART. THE STRAIGHT BLACK LINE AT THE LEVEL OF 33 POUNDS REPRESENTS THE AVERAGE NUMBER OF POUNDS OF WOOL COMMANDED BY A TON OF PIG IRON FOR THE ENTIRE PERIOD



FLUCTUATIONS OF THE PURCHASING POWER OF 1 TON OF PIG IRON IN POUNDS OF COTTON OVER A PERIOD OF 16 YEARS ARE SHOWN BY THE CURVE OF THE CHART. THE STRAIGHT BLACK LINE AT THE LEVEL OF 139 POUNDS ON THE SCALE REPRESENTS THE AVERAGE NUMBER OF POUNDS OF COTTON COMMANDED BY A TON OF IRON FOR THE ENTIRE PERIOD

hog quotations the purchasing power of pig iron in terms of hogs fell. The average line for the 16 years is 240 pounds and the present fluctuation of iron downward is bringing the relationship back toward a normal basis.

Reviews of New Books

A Survey of the Latest Literature of Interest to Producers and Users of Iron and Steel

Employee Training, by John Van Liew Morris, Ph.D., cloth; 311 pages, 5½ x 8 inches; published by the McGraw-Hill Book Co., and for sale by THE IRON TRADE REVIEW, Cleveland, price $3.00, postpaid.

This book presents the results of a thorough study of education and training departments in various corporations, including some of the largest in the iron and steel industry. The study was undertaken to determine to what extent manufacturing industry can be relied on to train its own workers. With the immense development of manufacture in America during recent years industrial executives have been more and more concerned over the fact that apprenticeship had practically broken down and specialization was producing a dearth of the old-time mechanics for maintenance work and as a reserve force from which foremen could be recruited. As the author states, two solutions of the problem were proposed, one, the revival of apprenticeship, the other, the establishment of vocational schools. The investigation undertaken by him was mainly into programs and organization being utilized in carrying out the first solution namely, employe training, has of late expanded into a much more comprehensive program than of apprenticeship alone. Intensive training for various productive activities, foremen training and for salesmen and minor executives are designations of the newer types. The study should be of interest to the educator as throwing some light on industry's own solution of its training problems and is equally interesting to manufacturers as suggesting programs of education and training recommened by previous experiences of others.

In the first section of the book are comprehensive programs for apprenticeship and special training, including the details of programs in the electrical manufacturing industry, rubber and automobile industries and various others, among which is that of the Carnegie Steel Co., and the Norton Co. Follow descriptions of programs which emphasize apprenticeship, the specific plans of a number of machine tool builders and other manufacturers being set forth. Next are given the programs emphasizing special training, programs of primarily technical instruction and general instruction for employe improvement. The author has presented in clear manner the features of many plans worked out by the leading industrial corporations, with the assistance of those in charge of the administration of such plans, and has corelated all the information in such a way that the book should be very valuable to all empoyers.

The Welding Encyclopedia, by L. B. Mackenzie and H. S. Card; cloth; 326 pages, 6 x 9 inches; published by the Welding Engineer Publishing Co., Chicago, and for sale by THE IRON TRADE REVIEW, Cleveland, price $5 postpaid.

This encyclopedia has been prepared to supply those interested in welding with a collection of definitions and explanations of the principal operations. One-third of the book is devoted to an alphabetical arrangement of the most common trade names and terms with information regarding their derivation and meaning. Illustrations are provided throughout to clarify the text. Subsequent divisions of the book deal with the various types of welding. The first of these is oxyacetylene, which is discussed from the standpoint of a person desiring to weld iron, steel or nonferrous metals. Electric arc, electric resistance, and thermit welding also are discussed in detail. Abstracts from the A. S. M. E. boiler code, and specifications and standards for welding established by state, federal and other organizations are presented in a separate chapter. Three pages deal with the essential principles involved in the heat treatment of steel. Tables and charts are grouped together in the back of the book and contain graphic reproductions and data relative to welding methods.

Elementary Machine Shop Practice, by James A. Pratt; cloth; 320 pages, 5½ x 8 inches; published by D. Van Nostrand Co., and for sale by THE IRON TRADE REVIEW, Cleveland, price $2.50.

"A text book which presents the elements of the machinist trade," is the scope of the book as outlined by the author. The many topics discussed in the 15 chapter include bench work, supplies and miscellaneous tools; hardening and temperting, machine adjustments, and equipment; lathe tools; lathe backrest, follow rest, compound rest, and eccentric turning; the drill press; shaper; slotter; grinder; milling machine; gearing; the planer; and machine shop calculations. The last chapter contains a glossary of the principal terms applied to machine parts and operations. Here also are 15 tables of data on steel rule graduations, screw thread standards, wire gage standards, sizes of machine screws and tap drills, decimal equivalents of drill sizes, cutting speeds, etc. A bibliography, and an enumeration of the related steps incident to the operation of the machines explained in the foregoing chapters is given. Each chapter is concluded with a list of questions pertaining to the previous text matter. More than 200 illustrations are distributed throughout the text.

Financial Engineering, by O. B. Goldman; cloth; 271 pages, 5½ x 8⅛ inches; published by John Wiley & Sons, Inc., and for sale by THE IRON TRADE REVIEW; price $3.50, postpaid.

This book is intended primarily for the practicing engineer and includes many mathematical deductions, examples and illustrations for the purpose of clarifying all discussions. When looked upon from the financial viewpoint this phase of engineering is divided into two parts, cost aggregation and cost analysis. The explanation in the opening pages of the text deals with basis of rates, comparative values, profits, depreciation, appreciation etc. Chapters, which follow, include compound interest formulas and other fundamental financial calculations; basic costs of boilers, centrifugal pumps, motors, standard pipe, hydroelectric installations; unit cost determinations determinations of size of a system for best financial policy and determination of costs and size of units.

At the beginning of each chapter subdivisions are enumerated which explain in a more detailed way the nature of the main topic. As an example of this in the last sections of the book, the names of which have been stated previously, the principal subjects are divided in detail as, operating costs, size and type of heating systems, and design of plant for economy. All illustrations are line drawings. Tabulated information occurs frequently and is given sufficient space to present clear summaries. Formulas which are utilized in the text have been arranged step by step. Lists of problems are given relating to each subject and which when solved will give a better understanding of the questions involved.

Solving Arc Welding Problems

Castings of Mild Steel Are the Easiest To Weld; Next in Order Come White Cast Iron, Gray Cast Iron, Malleable Iron, High Carbon Cast Steel and Finally Nonferrous Castings

BY A. M. CANDY

FROM the standpoint of the welding engineer it appears logical to consider foundries as usually being in one of three general classes: (1) those making castings exclusively for the trade; (2) those operated by and exclusively for large manufacturing organizations; and (3) those operated both for general trade and one or more manufacturing organizations. It is the writer's opinion that foundries in the first and third classes will of necessity be most exacting in requiring sound welds because the trade will be inclined to look upon a welded casting as being a second hand product until all interested parties are educated to the physical characteristics of good welds and how good welds can be produced and verified by inspection and tests. It is the purpose of this paper, to discuss the various factors upon which good welding is dependent and to present physical data pertaining to good arc-deposited metal. To discuss the various phases of the welding problem it is probably best to enumerate the many variable factors in the order of their relative importance, the first being considered the most important:

1. Physical and chemical characteristics of material proposed to be welded.

2. Welding education of supervisor or welding foreman. Also training and skill of welding operative.

3. Physical, chemical and electrical characteristics of electrode or metal to be used for forming the weld.

4. Physical and electrical characteristics of apparatus to be used for supplying welding energy.

The physical characteristics of arc welds and arc-deposited metal in which all foundrymen are primarily interested are entirely dependent upon the four factors cited. To conserve space and time it will be possible to consider only the most important features.

Castings are made in such an infinite variety of sizes and intricately cored shapes that it is practically impossible to make definite statements as to methods of welding procedure which are broadly applicable. For example, cast iron is relatively weak in tension. It also has very little ductility. The strains incident to welding and subsequent cooling are of great importance. It is not unusual to have a casting submitted for repair which could be welded much more easily if preheated before welding. Owing to the intricate shape, however, preheating may be difficult or out of the question due to the distortion which would be produced. If the latter is true it may be necessary for the operator to perform his work relatively slowly so as to keep the heating, due to the arc, at a minimum and in addition, it may be advisable to provide an auxiliary cooling medium such as an air blast. The chemical composition of a casting determines to a great extent the ease with which it can be welded. In general, the higher the percentage of carbon or other alloying constituents the more difficult it is to weld. In the order of their relative ease of welding beginning with the most desirable, castings rank as follows: Mild steel castings, white cast iron, gray cast iron, malleable cast iron, high carbon cast steel, and nonferrous castings, including aluminum, brass, bronze, etc.

Especially in the field of iron castings there are many different grades produced by varying the processes. For

Table I

Composition and Size of Welding Wire*

1—Chemical Composition:

	Per Cent
Carbon	—not over .19
Manganese	—not over .55
Phosphorus	—not over .05
Sulphur	—not over .05
Silicon	—not over .08

2—Sizes and weights:

Diameter fractions of inch	Diameter decimal equivalent	Pounds per 100 feet	Feet per 100 pounds
1/8	.125	4.16	2400
5-32	.156	6.51	1535
3-16	.188	9.37	1066

Allowable tolerance .006-inch, plus or minus.

3—Material—The material from which the wire is manufactured shall be made by any approved process. Material made by *puddling process not allowed.*

4—Physical Properties—Wire to be of uniform homogeneous structure, free from oxides, pipes, seams, etc., as proved by microphotographs.

5—Workmanship and Finish—(a) Electric welding wire shall be of the quality and finish known as the "bright hard" or "bright soft finish"—"black annealed" or "bright annealed" wire shall not be supplied.

(b) The surface shall be free from rust, oil or grease: a slight amount due to lubrication during last drawing being permissible.

6—Tests**—Electrodes must, before shipment or after delivery, show good commercial weldability when tested by an experienced arc welder. The electrode material shall flow smoothly in relatively small particles through the arc without any detrimental phenomena.

7—Delivery, Packing and Shipping—Electrodes shall be furnished in straight lengths of either 14 or 28 inches, put up in bundles of 50 or 100 pounds, as ordered. Each bundle shall be wrapped in heavy paper, securely wired, and marked on one end showing diameter in fractions of an inch, trade name and grade of wire.

Note:

*This wire may or may not be covered.

**If electrodes to above specifications sputter or flow unevenly, dip same in milk of lime (whitewash) before welding. This dipping may be done in quantity on stock on hand and allowed to dry, or welder may keep a pot of solution on hand into which the electrode is dipped immediately before welding.

From a paper presented at the Columbus convention of the American Foundrymen's association. The author, A. M. Candy, is connected with the Westinghouse Electric & Manufacturing Co., Pittsburgh.

example, we find very fine grained, white cast iron in which it is much easier to make a good weld, obtaining good fusion and a minimum of porosity or gas pockets. At the other extreme is very coarse grained, gray iron which is a very weak structure. When metal

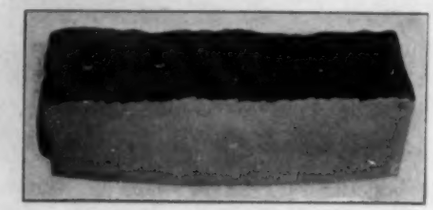


FIG. 1—ARC-DEPOSITED METAL BUILT UP FOR TEST PURPOSES

is deposited on such material by any of the arc processes the zone of fusion is very porous and as a rule a very appreciable amount of blue iron oxide (presumably Fe_3O_4) is present. The porosity is chiefly due to the high carbon content of the cast iron. This carbon is volatilized by the intense heat of the arc, forming relatively large volumes of carbon monoxide and carbon dioxide which are trapped by the deposited metal. It is for the same reason that high carbon content steels are more difficult to weld than medium and low carbon steels.

Nonferrous metals such as aluminum, copper, nickel, brass, bronze, monel metal and various other alloys are particularly difficult to weld, due principally to the relatively low melting temperature which results in rapid oxidation forming large volumes of gas, producing porosity and also producing slag inclusions in the deposited metal, particularly noticeable in the zone of fusion. The oxides formed by some of these

FIG. 2—DEPOSITED METAL CUT INTO THE FORM OF TEST BARS

metals have relatively little conductivity so that if present in the form of a continuous scale of appreciable dimensions the maintenance of an arc becomes much more difficult. Then, too, some of these metals have a very critical melting temperature passing quickly from the solid to a semiliquid state without passing through a very plastic condition. This obviously makes welding difficult.

Welding literature, including advertising, during the past two or three years has properly emphasized the importance and, we may add, imperative necessity of training operatives for the arc welding and cutting processes. As a general rule the candidate has only a few weeks at his disposal, therefore it is usually possible to give him only the underlying principles involving the mechanical manipulation of the welding tools and sufficient training to enable him to determine when a reliable weld is being made by inspection of the arc behavior, appearance of the deposited metal both when forming in the molten pool at arc extremity and by inspecting the deposits after being completed. In addition to these factors the welding supervisor or foreman, especially in a foundry, should have a general knowledge of the behavior of various types of castings under heat. He must know what

FIG. 3—FIRST STEP IN REPAIRING DEFECTIVE STEEL CASTING

types of defects can be repaired and must be able to recognize defects which are not susceptible to repair by welding. The judgment displayed by the supervisor in selecting repairable defects arranging for the proper preliminary preparation of the parts to be welded, applying preheating where desirable in a proper manner, and annealing the parts after welding when necessary, together with the manipulative skill of the operative, determine the success of the welding applications. After having seen the exhibits of almost unbelievably poor welding work in the office of A. G. Pack, chief inspector of bureau of locomotive inspection at Washington, the writer does not believe it is possible to emphasize too strongly the necessity of training men to make skilled welders and competent supervisors.

For welding medium and mild steel castings by the metallic electrode process a bare wire electrode conforming with the specifications adopted by the American Welding society, as shown in the accompanying table, will be found amply satisfactory. For welding white cast iron castings the same electrode material can be used. In general, where the nature of the work on any grade of cast iron, including malleable, will permit of the use of the graphite electrode process a better weld

FIG. 4—SECOND STEP IN REPAIRING STEEL CASTING

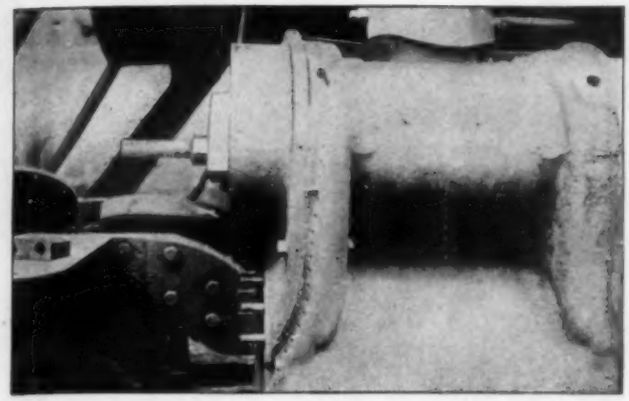
can be made. Although hard carbon electrodes can be used, experience indicates that a lower rate of electrode consumption is obtainable if graphite electrodes are used. Both electrodes are made from the same base and binder but the graphite electrode is produced by baking a carbon electrode at a temperature of about 2000 degrees Cent., which is sufficiently high to graphitize the binder, thereby improving the binding power and homogeneity of the electrode and decreasing its resistance. These electrodes can be purchased in standard lengths of 12 inches and in diameters of 1¼-inch up to and including 1 inch. Each electrode should be kept tapered at the arc end in a conical shape at about 45 degrees, the point being left about ⅛ to $\frac{3}{16}$-inch

FIG. 5—SHOWING COMPLETED REPAIR TO DEFECTIVE STEEL CASTING

the arc. The diameter of the electrode in diameter. The tapered point materially assists the operative in controlling required depends upon the current to be used. The combinations in most common use are about as follows:

Amperes	Diameter in inches
50 to 125	0.25
150 to 250	0.375
300 to 500	1.000

When the graphite electrode process is used either on steel or cast



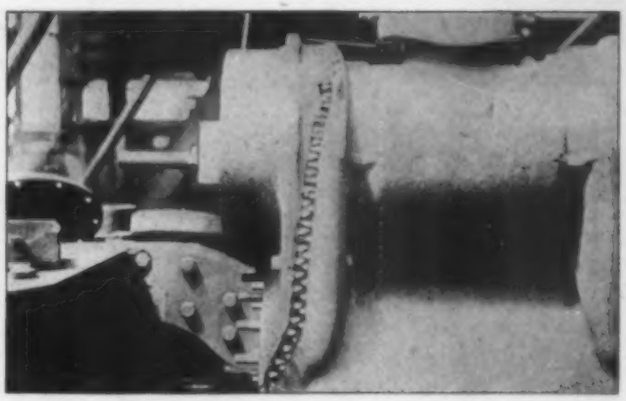


FIG. 6—HOLES DRILLED IN BROKEN IRON CASTING PREPARATORY TO INSERTING STUDS. FIG. 7—STUDS IN PLACE PREPARATORY TO WELDING

iron castings the best filler metal is low carbon steel or commercially pure iron in rods of ⅜ or ½-inch diameter, depending upon the current to be used. The use of cast iron rods, manganese steel rods, or other alloy rods is not recommended because the resulting deposit usually will be more porous. It is not as easy to obtain good fusion and the deposited metal will be much harder, making the finishing of the weld by machining or grinding much more difficult.

In the field of nonferrous metals probably copper is the most susceptible to welding of any of those listed. However, at the present stage of the art we do not feel warranted in making broad claims for this application.

When working on copper the use of the graphite electrode process and a flux such as borax is usually to be recommended. A skilled operator, even with careful manipulation, is not able to entirely eliminate porosity. Furthermore the fused copper is cast metal and is therefore relatively brittle. At present it is felt that a great deal of development work will be required by electrode metal manufacturers to produce electrode materials better suited to the welding of the various nonferrous metals and their alloys.

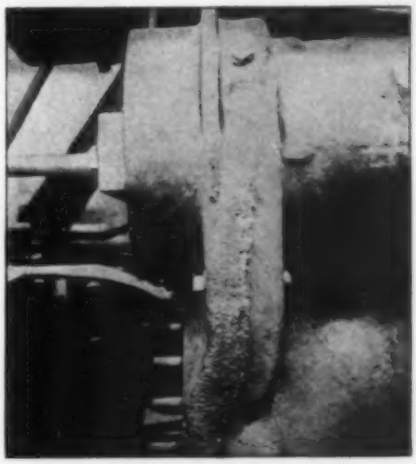


FIG. 8—REPAIRED CASTING SHOWING COMPLETED WELD

To determine the physical characteristics of (mild-steel, bare-metal electrode) arc-deposited metal a 14-pound deposit was built up on a steel plate approximately ½ x 3 x 8 inches, the deposit being about 2 inches deep as illustrated by Fig. 1. Standard commercial practice was observed in this work, the operator exercising average care. No cleaning of the deposited layer was performed except by means of a stiff wire brush, no sand blast being used. Using only the deposited metal, two standard tensile test specimens were cut out as illustrated by Fig. 2. Other specimens also were obtained for compression, bending and shear tests. The results obtained are shown in Table II.

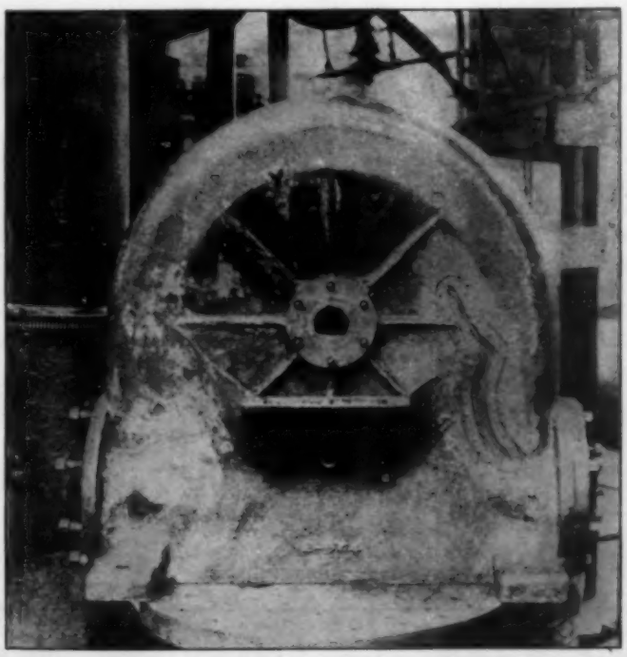


FIG. 9—REPAIRING BROKEN CASTING BY MEANS OF THE CALKING GROOVE METHOD USED BY THE NAVY DEPARTMENT. FIG. 10—ANOTHER EXAMPLE OF WELDING BY THE CALKING GROOVE METHOD

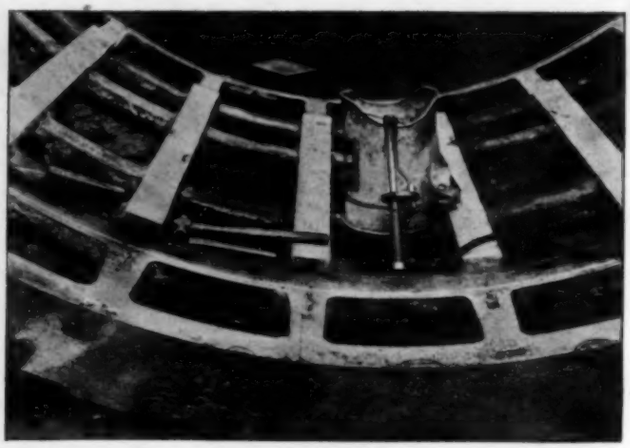


FIG. 11—THE FIRST ROUGHING CUT ON THIS CASTING DISCLOSED A SERIES OF BLOW HOLES ON THE UPPER FLANGE.
FIG. 12—THE BLOW HOLES WERE EFFECTIVELY FILLED UP BY MEANS OF ARC-WELDING WITHOUT THE NECESSITY OF PREHEATING THE CASTING

A deposit similar to Fig. 1 was built up but as each layer of metal was completed it was thoroughly brushed and sand blasted. Standard tensile test pieces were cut from the deposited metal which tested as shown in Table III.

The fractures had the appearance of high grade partially-annealed low carbon cast steel. It is interesting to compare tests Nos. 5 and 6 with Nos. 1 and 2 and observe that while sand blasting the layers of metal did not appreciably affect the tensile strength, it did improve the ductility of the metal as evidenced by the per cent elongation and reduction of area. This is probably due to slag elimination to a greater degree. By close inspection of Fig. 1, one can see along the polished surface a scattering of relatively small imperfections. In the case of the sand blasted specimen, however, these are practically eliminated.

To give an idea of the physical properties of commercially welded cast steel, 10 steel bars, each 1 inch in diameter, were beveled and welded to obtain five welded specimens. The welded bars and also five bars of the original steel were turned into standard threaded test pieces similar to those shown at the right of Fig. 2. Table IV shows the results of these tests.

If we consider the average values of yield point and ultimate tensile strength, the welded specimens developed about 81.5 per cent of the ultimate tensile and 83.3 per cent of the yielding strength of the unwelded original steel castings.

Figs. 3, 4 and 5 show the various stages of a steel casting which was found defective due to large sand pockets. The entire defective part was cut out with the graphite electrode to fit the rectangular steel block which was then set in place and welded in position, using the graphite electrode process.

Where iron castings are to be repaired in the case of an extensive break, particularly if the grain is coarse, it is customary to use the studding method as illustrated by Figs. 6, 7 and 8. At one of the navy yards it has been the custom to provide a calking groove as shown by Figs. 9 and 10. Metal is deposited in the calking groove first, after which it is thoroughly peined down with a view of preventing steam leakage.

Figs. 11 and 12 show a large casting in which blowholes were discovered upon taking the first roughing cut. This type of welding application is particularly attractive and the actual saving in dollars, although large in itself, is often insignificant. The great gain, therefore, in many instances is made in time which with the cast constitutes the economic gain.

When the arc is used to melt part of a given piece of metal so that a portion of it can flow away or so that it becomes divided into two or more sections we speak of the fusing operation as that of cutting. The action is principally that of supplying sufficient localized heat to liquify the metal whereas in steel the gas process relies principally upon the union of the metal with oxygen (burning) forming slag which is carried out of the cut by the volume and velocity of the supplied gases.

The Figs. 13, 14 and 15 indicate the speed of cutting cast iron sections using about 600 amperes.

For cutting, the graphite electrode is usually used with current values of from 150 to 800 amperes, depending upon the class of work, speed desired

Table II

Results of Tensile Tests

Test No.	Pounds per square inch Ult. strength	Yield point	Elas. limit	Per cent Elongation in 2 in.	Reduction in area
1	58825	41000	40000	8.2	19.9
2	54650	35000	29000	6.5	13.4

Compression Test

Test No.	Pounds per square inch Ultimate Strength	Elastic Limit
3	95,400	34,500
4	92,450	29,450

Bending Test: Bar, ½-inch thick was bent through an angle of 100 degrees around a steel rod of 1 inch radius.
Shear Test: Two specimens failed at 46,200 and 44,600 pounds per square inch respectively.

Table III

Sand Blasting Improves Ductility

Test No.	Pounds per square inch Ult. strength	Yield point	Elas. limit	Per cent Elongation in 2 in.	Reduction in area
5	56,075	35,875	29,000	16	23.4
6	58,225			18	27.8

and capacity of the electrical equipment. For example a ½-inch thick, medium-steel plate can be cut at the rate of about 1 foot in 12 minutes using 150 amperes or about 1 foot in about 1¼ minutes using 400 amperes. Fig. 4 illustrates a good example of graphite electrode arc cutting.

Cutting can be done with the metallic electrode process, employing bare wire or heavily wrapped wire. To use the bare wire it is necessary to operate the electrode at a much higher current than for welding, which results in scattering the metal and making it difficult for the operator to maintain the arc. The wrapped electrode is undoubtedly the better suited for this work, especially if it is dipped in water frequently during the operation. In fact, it is possible to cut with this combination in cases where it is out of the question to use the graphite process. For example, during the war the British navy used water soaked, heavily wrapped electrodes for cutting holes 2 inches in diameter and several inches deep in armor plate on battleships for attaching rigging to protect against submarine torpedoes.

Insofar as the foundry is concerned, the electrical equipment required is essentially the same as for other industries, the chief differences probably being in the technique of operation. For example, it is probably safe to say that in most foundries the majority of the castings have relatively heavy sections of 1 inch or greater in thickness. Most of the welding work is such that each operator requires relatively high current values, namely, from 175 up to and including 500 or 600 amperes. The question of current capacity, although important, must not be allowed to over-shadow other important features. In the first place do not be misled into thinking that any person can make a weld by using good welding equipment. It is impossible for an unskilled or an untrained operative to make good welds consistently even with the most satisfactory equipment. Likewise a skillful, trained welder will be able to make reasonably good welds under proper conditions, with practically any equipment available. However, he will observe after working with various welding outfits that it is easier for him to make good welds consistently, at greater speed and less expenditure of nervous energy with some equipment than with others. To provide for this condition the design and construction of the electrical equipment must be such that the following characteristics prevail at the arc:

1. Arc must easy to start.
2. Arc must be easy to maintain.
3. Arc must produce sufficiently deep fusion or penetration in surface of casting or parts to be welded.
4. Current through the arc should remain practically constant at any value of arc voltage drop between limits of 20 to 0 volts.

Undoubtedly the best way to determine the existence of the first two characteristics is to actually work with various equipments under identical conditions, using the metallic electrode process. However, these characteristics can be illustrated by means of the oscillograph,

Table V

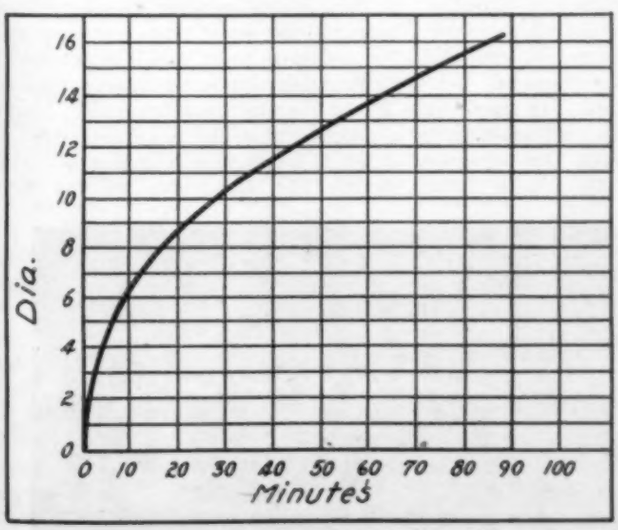
Current Values Under Varied Conditions

No. of generators connected in parallel	Range of current metal electrode	Values obtainable graphite electrode
2	150-430	100-300
3	225-645	150-450
4	300-860	200-600

Table IV

Comparison of Welded and Unwelded Specimens

Bar No.	Pounds per Square Inch Ultimate Strength	Yield Point	Per Cent Elongation in 2 inches	Per Cent Reduction in area
Welded Specimens				
1	57,100	30,600	10.0	21.8
2	54,200	29,700	7.0	14.7
3	45,000	27,600	5.0	14.7
4	51,200	30,700	8.0	14.7
5	55,700	32,200	9.0	18.6
Average	52,640	30,160		
Original Non-Welded Specimens				
6	63,000	35,800	36.0	56.9
7	64,000	37,300	35.5	58.3
8	61,400	35,800	36.0	58.3
9	63,000	36,300	36.0	57.7
10	61,400	35,800	31.0	58.3
Average	64,560	36,200		



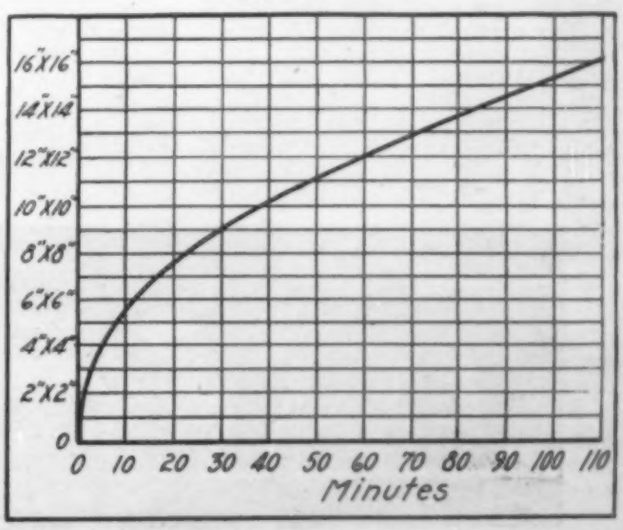


FIG. 13—RATE OF CUTTING CIRCULAR SECTION OF CAST IRON BY THE ARC PROCESS. FIG. 14—RATE OF CUTTING CAST IRON BLOCKS BY THE ARC PROCESS

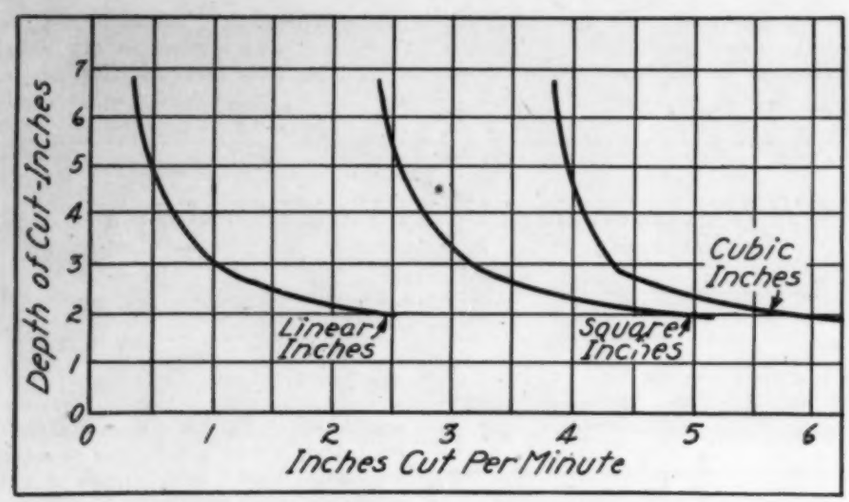


FIG. 15—RATE OF CUTTING CAST IRON PLATES

as will be clearly pointed out later.

Arc welding outfits are available in single-operator and multiple-operator types. The former type is illustrated by Fig. 16, the scheme of connections

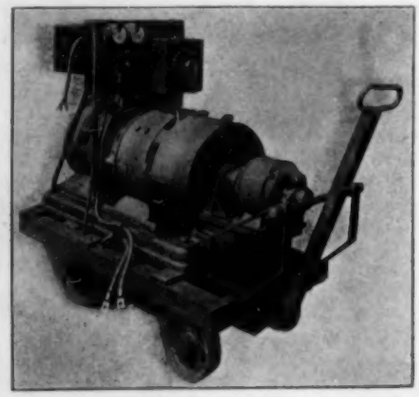


FIG. 16—A REPRESENTATIVE SINGLE OPERATOR TYPE ARC WELDING OUTFIT

is shown in Fig. 20. This equipment is a new departure in the field of one-man outfits. It is not within the province of this paper to discuss fully the design and characteristic of this machine since this has been done very thoroughly by two papers presented at the annual convention of the American Institute of Electrical Engineers at White Sulphur Springs, W. Va., June 29-July 2, 1920. It is sufficient therefore to point out that the unique design which interconnects the 125-volt constant voltage exciter circuit with the variable-voltage constant-current generator circuit, gives the arc all the stabilized characteristics of the multiple operator 60-volt constant potential equipments, without requiring any stabilizing resistance in the welding circuit, and with a nominal external reactance or stabilizer coil.

This machine delivers welding current in 20 steps between the limits of 50 and 215 amperes at 20 volts for metal electrode welding and delivers 150 amperes at 35 volts for graphite electrode welding. For work requiring higher current values, two or more machines can be easily and quickly operated together in parallel by simply connecting the positive or ground cables of the various generators to the work and by connecting the negative or electrode cables to a single electrode holder. This then provides for current values as indicated by Table V.

This type of equipment is therefore adapted to small foundries which require an appreciable amount of metallic electrode work as compared with graphite electrode work. In part, for such foundries two medium-capacity single-operator machines, for example, will be more flexible and a better investment than a single high capacity unit because the two machines can be operated independently for two operators, whereas, only one operator can work with a high capacity single operator unit.

For building up pads on castings, especially on vertical surfaces, the metallic electrode process is the better. Many operators build up such pads somewhat over size and then trim them down with the arc using the graphite electrode. If the pad is not too large it can be brought to a temperature above a red heat so that it can be hammered vigorously, thereby improving the grain structure and external surface appearance of the deposited metal.

For filling in large cavities such as blowholes, sand holes, etc., in castings the metallic electrode process of employing large diameter electrodes and high current values of 300 to 450 amperes, can be used or the graphite electrode process using 300 to 600 amperes can be used. However, the author wishes to state that in the hands of the average

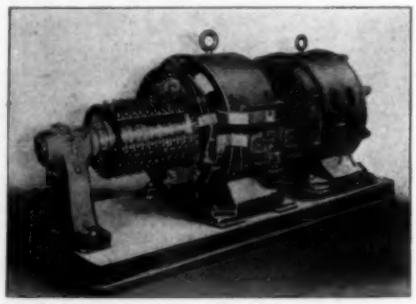


FIG. 17—A TYPICAL MULTIPLE-OPERATOR MOTOR GENERATOR

operator the use of current above 200 amperes with the metallic electrode or the graphite electrode process should be limited to welding work where strength is secondary to increased speed and decreased cost of performing the work.

The multiple operator 60-volt constant potential equipment has been available for so many years and has proved to be so satisfactory and reliable, particularly for group installations in large foundries, that it is unnecessary to dwell at length upon this type of equipment. The significance of the term

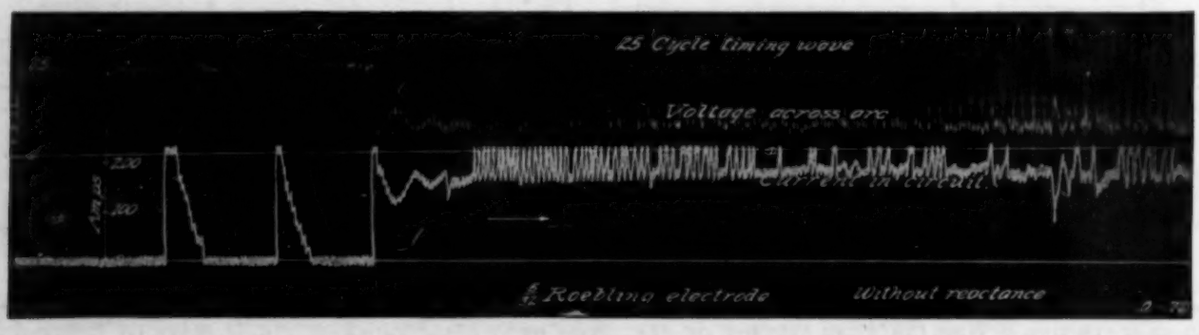


FIG. 18—WITH NO REACTOR IN THE CIRCUIT THE OPERATOR STRUCK HIS ARC THREE TIMES BEFORE CATCHING

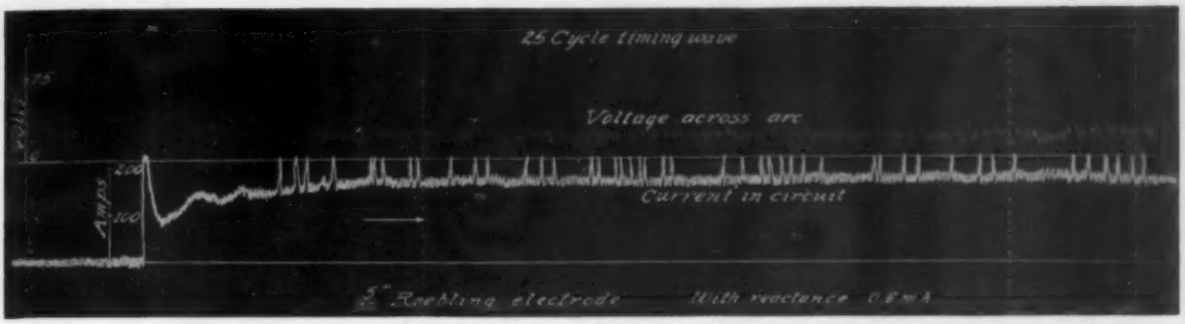


FIG. 19—WITH A REACTOR IN THE CIRCUIT THE OPERATOR CAUGHT THE ARC ON THE FIRST ATTEMPT

"multiple operator" is that the generating equipment and control apparatus for the welding circuits are designed so that two or more operators can draw welding currents of different values from an individual generator without any arc interference. The multiple operator equipment is particularly adapted to foundry installations where a number of operators will work close together because the installation and investment cost will be less than for the required number of single operator equipments.

Multiple operator motor-generators are available in capacities of approximately 300, 500, 750 and 1000 amperes. A typical unit is shown in Fig. 17.

In connection with this type of equipment many purchasers have failed to properly appreciate the use of a relative small reactor in each metallic electrode welding circuit in addition to the resistance to facilitate striking and holding the arc. The latter feature is most noticeable when the operator is welding on poor material containing foreign matter such as occluded gas or grease, a high percentage of carbon, or other gas-forming elements, which will have a very decided tendency to blow out the arc.

The reactor is simply an inductive coil which delays the rate at which the current builds up through the electrode when it is touched against the work incident to striking the arc. This minimizes the tendency for the metallic electrode to stick or "freeze" to the work. The reactor also stores electromagnetic energy which counteracts unstabilizing influences such as mentioned above. In fact, the reactor gives the multiple operator welding circuit the desirable characteristics of the interconnected single operator equipment. To illustrate the assistance in striking the arc, oscillograms shown in Figs. 18 and 19, are submitted. In each of these cases the welding circuit was adjusted to deliver about 175 amperes, 20 volts at the arc and 60 volts at the generator. In the former case, with no reactor in the circuit, the operator struck his arc three times before catching it. In the latter case with the reactor in the circuit the arc was caught at the first attempt. This piece of apparatus is obviously a very desirable asset particularly for circuits to be used for training new operators. Obviously it also will conserve time and nervous energy of a skilled operator which should result in a larger and better daily welding production.

Fluorspar Output Gain Is 34 Per Cent

ACCORDING to a recent report of the United States geological survey, the mining and importation of fluorspar showed an upward trend during 1920. The statistics for the year show that 186,000 tons were shipped from the mines as compared with 138,290 tons in 1919, a gain of approximately 34 per cent. However, the total for 1920 is about 29 per cent under the tonnage for the record year in 1918 when 263,817 tons were produced.

Imports of fluorspar increased more rapidly than did the domestic output, the amount entering the country in 1920 being 24,610 tons as against 6943 tons in 1919. The total for 1920 is greater than that for any year since 1913. This increase in imports can be attributed to the difficulties involved in obtaining home products, as shipping delays, and labor troubles and also the easing up of the ocean transportation situation.

Most of the imported fluorspar is consumed in the Lehigh and Susquehanna valleys of Pennsylvania where it can be delivered at a comparatively low price on account of savings in freight rates. According to a consumer who uses a large quantity of the imported product the foreign material contained on an average of 75 per cent calcium fluoride and 4 per cent silica. The domestic product according to the same user contains 85 per cent calcium fluoride and 6 per cent silica. The better grades of fluorspar produced in this country are more efficient than that imported. Another user of the English product makes the statement that this fluorspar has a calcium fluoride content of from 83 to 87 per cent and silica 8 to 10 per cent.

Canada supplied the United States with only small quantities of fluorspar prior to 1919, the largest amount being in 1918 when a total of 913 tons was reported. A decided increase was made during 1920 when the total leaped to 7068 tons.

In this country the fluorspar mining industry is spread over a considerable territory with Illinois the principal producing state as the center of operations. This state alone mined 65 per cent of the total domestic fluorspar. Shipments from Illinois during the year just closed were 121,000 tons, or 30 per cent in excess of 1919 when the amount was 92,729 tons.

The outlook for 1921 involves a number of conflicting factors. At the close of 1920 only a small amount of new business was being booked, although old contracts were keeping some of the larger producers in operation. Among the disturbing elements are the increasing tonnage of imports and the growing importance of Canadian competition. These developments have prompted the preparation of tariff resolutions by the fluorspar producers. Moreover, large stocks of fluorspar are on hand, which will be consumed slowly due to the general industrial depression and it is probable that contracts will be withheld in anticipation of lower prices. There seems to be a tendency to specialize on high grade fluorspar particularly among western consumers.

The investigations from which these conclusions have been drawn were carried on by Hubert W. Davis, in charge of fluorspar statistics for the United States geological survey, and Raymond B. Ladoo, mineral technologist, United States bureau of mines.

Handling Flue Dust Economically

Fine Ores Carried Out of the Blast Furnace by the Gas Is Recovered in Settling Tanks and Pumped Hydraulically Into the Top of the Stack— Description of Direct Recovery Process

BY GEORGE B. CRAMP

THOUGH practice at various plants differs as to the number and size of the dry dust catchers used, there is but slight difference in their design. They usually are built in cylindrical shape with an inverted conical bottom which forms a hopper for the dust and larger stock deposited therein; the top usually is dome or conical shape. The downcomer or downcomers, which conduct the gas from the top of the blast furnace, enter through the top or the side of the dust catcher. The gas outlet connection may be arranged at either place, but preferably opposite, or as far from the inlet of the downcomer connection as possible. Little advantage is gained by either arrangement, however, as the amount of dust precipitated in the dust catcher varies in accordance with the velocity and dust content of the gas passing through it, and the larger the dust catcher the lower the velocity of the gas and the greater the dust precipitation therein. The dry dust catcher offers great possibilities in the economic handling of flue dust if designed as a separator for separating flue dust from the larger coke, ore and limestone stock discharged from the furnace during a slip. Separation of these grades would permit the fine dust to be sluiced or flushed out of the separator with the same water that is previously used to wash the gas in the wet gas washer, thus accomplishing the combination of all flue dust and necessitating but one method of handling thereafter. The larger stock brought down within the separator is freed from dust and held within the separator until drawn off into cars and taken to the ore or coke bins to be recharged into the furnace. The proposed improvements are shown in the accompanying illustration.

The first and greatest saving in cost of handling flue dust and recovery of bulkier stock is possible of realization. The proposed improvements predetermine the extremely simple methods of handling the flue dust in wet form, this being made possible by the separating and dust flushing features of the design.

At some plants further efforts are made to precipitate dust in the dry state, between the dry dust catcher and the wet gas washers by installations of secondary dust catchers, dust legs or pockets and dry whirlers, all of which catch some dust as the gas passes through them. Deposition of the dust would occur, however, if an almost infinite number of pieces of apparatus were used to recover the dust in a dry state, and it is for this reason that recent practice has inclined toward the omissioin of all dry dust catching devices between the first dry dust catcher and the wet gas washer, and installing the gas washer as close to the dust catcher as possible so that the connecting gas main may be shortened to the minimum and otherwise arranged to be self-cleaning, in that no dust will find a lodging place throughout its length.

Wet gas washer design, in the past, has covered widely different views on various types of apparatus for washing dust from blast furnace gas, using water as the washing medium. All these types of washers may be roughly arranged into two groups, namely, power driven and stationary washers. Of the power driven washers the Thyssen is a good example, and is one of the few designs of power driven washers remaining in practical use; and this for secondary, or final washing only. It seems to be entirely out of consideration as a primary washer or scrubber.

In the stationary group of washers the rain, or spray type, and the baffle types form two subdivisions. By the rain or spray type is meant those washers or scrubbers as they are more often called wherein a rain or spray of water is dropped from a considerable height within a tower through which the gas travels upward, the dust carried by the gas being washed out by contact with the spray of water.

Within the baffle-type washers, sprays of water are directed on bafflers made of wood or metal, the surfaces of which serve to retard the fall of the water as it falls from top to bottom of the scrubber. The baffles are so arranged that they split up the gas body as it travels upward through the scrubber and causes the gas to come into more intimate and positive contact with the wet surfaces of the baffles on which much of the dust impinges and is then washed off by the continuous spray of water directed on them.

Of the two types of stationary washers just described the baffle type has proved to be of greater efficiency for two reasons: First, in the rain or spray type scrubber heavier sprays of water usually are required to break up and penetrate the gas body. A strong wind often is seen to blow sheets of rain at a sharp angle to the perpendicular, and gas acts likewise in a spray-type scrubber, except that being confined within the scrubber the gas tends to travel through the spray. Second, in a well arranged baffle scrubber the gas is split up into thin bodies which are compelled to travel between two wet walls, thus preventing their surging or channeling. A further advantage is gained by the baffles in that they retard the fall of water, thus bringing a given quantity of water into longer contact with the gas and thereby causing it to wash out more dust from the gas.

The nature and position of baffles within a gas scrubber are determined by simple considerations. For example, if a wet board or sheet of metal 1 foot square is projected into a moving body of dirty gas, with its greatest area at right angles to the direction of the flow

Flue Dust Recovery Is Live Subject

ONE of the most important problems encountered in modern blast furnace operation is the handling of flue dust. In view of the many methods now in use, and the amount of effort being expended in experimental work to improve present practice, the accompanying article will prove of interest to blast furnace men, especially those who are face to face with the problem of the economical disposition of the dust or sludge. The method proposed by the author lacks the confirming evidence of actual test, but to many furnace operators his reasoning doubtless will appear sound. Certainly the subject is worthy of the attention of all practical blast furnace men, and therefore the accompanying discussion on flue dust recovery, aside from the description of the suggested arrangement of apparatus, is timely.

The author, George B. Cramp, is associated with the engineering department of the Carnegie Steel Co., Clairton works, Clairton, Pa.

of gas, it will be found to pick up no more dust from the dirty gas than if turned 90 degrees to the original position, while the resistance to the moving body of gas, with the baffles in the first position, would be much greater. It is for this reason that baffles are set edgewise or parallel to the direction of gas flow.

After exposure of 1 square foot of wet baffle surface to a body of dirty gas in the manner just described, it will be found to have collected a certain amount of dust in a given length of time. If twice the area of baffle surface is exposed to the dirty gas, about double the amount of dust will be collected, and by provision of ample baffle surface a given volume of gas of given dust content, is cleaned continuously or washed of dust by the action of the water spray directed on the baffles.

Construction of Baffles

In the selection of materials for baffles wood usually is chosen, mainly because it is a cheap material and because it can be built readily into the scrubber. Wooden baffles, however, have some serious disadvantages. One of these is the bulk of the wooden baffle, which is usually about 1 inch thick. As the spaces between the baffles cannot be much less than 1 inch, because of the tendency to warp, and thus close the openings between them, it readily is seen that baffles of wood occupy one-half of the cross sectional area of the scrubber in which they are placed. On this account a scrubber shell of twice the diameter is necessary than would be required if thin plates or sheets not over 1/32-inch thick were used. This is a serious consideration when arranging spray water distribution as the area over which a given quantity of water is to be sprayed is about twice as great with wooden baffles as would be required with thin sheet baffles.

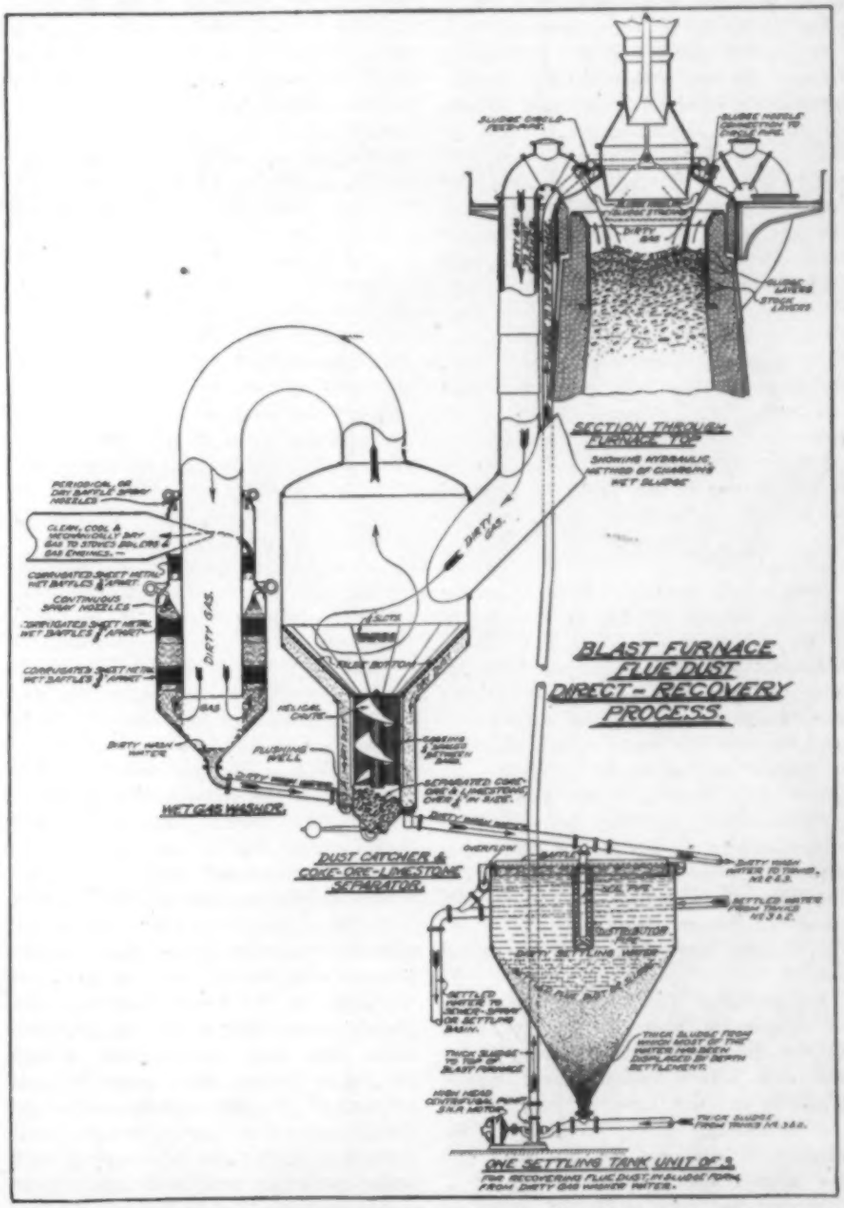
A further objection to wooden baffles is their liability to being over dried and warped if the water should go off the scrubber while in operation. At least one instance is known where the baffles have taken fire during construction, causing the scrubber shell to buckle badly.

After having been washed by contact with wet baffles and spray, the gas has been cooled and cleaned of practically all dust. But on leaving the scrubber it carries with it considerable entrained moisture in the form of fine water mist which has been picked up and carried along by the gas as it moves out of the scrubber at high velocity. It, therefore, is desirable to remove this moisture within the scrubber by causing the gas to impinge on baffle surfaces not sprayed constantly with water. The moisture in the gas coming in contact with the baffle surfaces gathers on them and, forming in drops, trickles down and off the baffles. For removal of moisture from gas in this manner the wooden baffle is not well suited because of its bulk and as the drying area necessarily is considerable it would be impractical to consider this construction within a scrubber.

Probably as great if not a greater problem than that of gas washing itself is met with in considering proper methods for the disposal of dirty water from the gas washer. In the past government restrictions have made it imperative that water used in blast furnace gas washers be settled first in properly constructed tanks, basins or ponds of sufficient size to accomplish the retention of most of the dirt from the water before it is turned into public watercourses where it rapidly clogs or obstructs the channels, the yearly deposits from a gas-furnace plant being enormous.

From an economic viewpoint it is even more important that the gas washer water be made to yield its valuable burden of latent raw material. Several different designs of settling basins are in use, in most cases it being the practice to divert the water from all scrubbers to one basin and for this reason the basin must be of such large dimensions as to necessitate its being located some distance from the furnaces or scrubbers in order to secure the space required for its installation.

The basin may be of single-compartment construction or more usually of two or more compartments which permit of one being cleaned of the deposited flue dust sludge while the dirty


SECTION THROUGH FURNACE TOP
SHOWING HYDRAULIC METHOD OF CHARGING WET SLUDGE
BLAST FURNACE FLUE DUST DIRECT-RECOVERY PROCESS.
DIRTY GAS
WET GAS WASHER
DUST CATCHER & COKE-ORE-LIMESTONE SEPARATOR
ONE SETTLING TANK UNIT OF 3

PROPOSED PLAN FOR RECOVERING BLAST FURNACE FLUE DUST AND CHARGING IT IN THE FORM OF SLUDGE INTO THE TOP OF THE STACK

wash water flows through the other. Cleaning or dredging is done with a locomotive or overhead electric crane. A more recently developed design of settling basin accomplishes settlement and cleaning continuously in one circular basin, the cleaning being accomplished by use of a bottom scraper or plow mechanism which works the sludge toward the center of the basin, from which point the sludge is then pumped.

At plants where it is the practice to recharge the wet sludge into the furnace, it would be a decided advantage to settle the dirty wash water in two or three tanks the diameters of which need not be over 22 feet with a depth of 10 feet to handle the dirty wash water from the gas washers of a modern furnace plant. Settling tanks of this size could be located near the furnace. The tanks could be of deep conical bottom construction permitting the sludge to settle to a considerable depth, and the greater the depth attained the more dense and less watery the sludge becomes. With this arrangement sludge at almost any desired consistency could be tapped off at the bottom of the tank and charged as desired.

Additional Complications

Where it is regular practice to charge into the furnace all flue dust recovered in the wet form and where it would be desirable to charge in the wet state all dust produced, the problem is further complicated because of the dust recovered in the dry state, which amounts to more than that recovered in the wet state. Dry dust at some plants, and both wet and dry dust at others, is transported to a sintering or briquetting plant and after treatment, according to the process employed, the product in sinter or briquet form is returned to the furnace and charged in the usual way.

Consideration of either the sintering or briquetting processes for treatment of flue dust is obviated, however, if the flue dust is all combined and brought down in the wet form as suggested in the foregoing, which leaves only the method of charging the flue dust into the furnace open for consideration.

Where flue dust is treated either by the sintering or briquetting process, the method of charging is simple. The product from either plant is dumped into the stock bins at the furnace where it is then charged into the stock larry car and thence into the skip car, as is all the coke, ore and limestone charged into the furnace.

Where all flue dust is to be brought down in the wet form, however, the method of charging is a matter of serious consideration. It has already been stated that at some plants wet flue dust is charged directly into the blast furnace without being either sintered or briquetted. This practice is not accomplished without considerable cost of handling and other inconvenience, and thus far no standard system of handling or charging seems to have been developed.

At some plants both dry dust and all ore are wet down with water before they are hoisted and charged into the furnace. However, an objection always is raised to this practice, because of the fouling effects of wet stock in the skip car and on the charging mechanism but where the recovery of all dust in wet form is accomplished as previously suggested, the charging of wet sludge is greatly simplified by application of the hydraulic system for lifting the wet sludge through a pipe to the top of the furnace where it can be easily distributed within the furnace through a circle pipe and specially designed nozzles which pierce the top cone of the furnace and introduce the sludge without bringing it into contact with any of the charging mechanism, accomplishing at the same time an even distribution of the sludge while the excess moisture in the sludge accomplishes a desirable wetting down of the other stock charged into the furnace in the usual manner.

The foregoing description of methods, practice and apparatus with suggestions for improvement thereon is based on actual operation, recent development, or experiment. The actual design of apparatus required to accomplish the suggested improvements is represented in the accompanying illustration, and described in the sequence of the order of their operation in the following paragraphs.

The dust catcher is about of the usual design except that it has imposed about 18 inches above and inside its conical bottom a false conical bottom of plates. The latter have ¼-inch slots so arranged as to allow all fine dust and particles smaller than ¼-inch to pass from the upper to the lower chamber, which chambers are formed by the false bottom. The dust after passing through the false bottom drops into the true bottom of the dust catcher and slides thence into the dust flushing well. Here it is flushed out by the dirty wash water previously used in the gas washer.

Any particles brought down in the dust catcher that are too large to pass through the ¼-inch slots in the false bottom simply slide down the false bottom into the helical chute in the bottom center of the dust-catcher separator. This helical chute is encaged in a cylindrical cage of bars with ¼-inch spaces between them. In ordinary operation this chute would not be required, but in cases of bad slips when tremendous quantities of coke, ore and limestone with much fine dust are thrown suddenly into the separator, much of the fine dust would remain unseparated except for the presence of the helical chute, down which all this stock must pass on being dropped out of the dust-catcher separator into hopper cars. The chute directs all material rolling down it against the encaging bars; the fines, or particles smaller than ¼-inch, sift out between the bars into the flushing well.

By this separation much valuable stock is immediately made available for recharging into the furnace, and without cost for screening or otherwise handling except transportation to the stock bins. The fine dust separated within the separator is carried out of the flushing well by the water from the gas washer, thus eliminating all cost of handling and treating in the dry state.

Course Followed by the Gas

After dropping much of the heavier dust in the separator the gas passes through a self-cleaning gas main into the gas washer. It enters through the leg of this main which drops vertically into the center of the washer. The purpose of this construction is to accomplish uniform gas distribution on entering the washer and drop a large part of the heavier dust, still carried by the gas, immediately into the bottom of the washer. A further object is to permit the washer being used as a water seal gas valve. By this arrangement the transverse sectional area of the washer is lost to gas cleaning to the extent of the transverse sectional area of the gas main dropping through it. The thin corrugated sheet metal baffles heretofore suggested occupy so little of the transverse sectional area of the washer effective for gas washing, that the shell diameter of the washer may be even less than scrubbers in which wooden baffles are used. Furthermore, the area over which the water spray must be distributed is so much less than that of larger diameters that a material increase in gas washing efficiency is obtained.

On entering the washer through the open end of the drop leg of the gas main the gas turns an angle of 180 degrees and rises uniformly up through the torrent of falling water and begins to pass through the lower set of baffles, which are of thin corrugated sheet metal and spaced about ¾-inch apart, being held thus by simple indentations of the corrugations which occur at odd points on the sheets.

In the first or lower baffles each cubic foot of gas is subjected to 80 square feet of cleaning surface, using a standard 3-inch corrugated sheet, and the gas is thereby cooled and cleaned of the heavier dust. The dust combining with the water flowing down the surfaces of the baffles is washed continuously into the bottom and thence out of the gas washer.

Still rising upward, the gas passes

through a second set of baffles similar in construction to those just described, but spaced ⅛-inch apart. Each cubic foot of gas in passing through these baffles is subjected to 160 square feet of additional cleaning surface and is cleaned of dust and cooled to within a few degrees of the entering wash water.

The gas travels through these baffles at about half the velocity it traveled through the entering main, but above the continuous spray nozzles shown in the illustration the shell is contracted to a small diameter. By this construction the gas velocity is increased. The increased velocity of the gas accomplishes a more forceful impingement of the water mist picked up in the lower part of the washer, against the dry or unsprayed baffles set in this section of the washer. These baffles are spaced about 3/16-inch apart and each cubic foot of gas in passing through them is subjected to 320 square feet of drying surface. As the mist continues to impinge on the baffle surfaces it forms into drops and flows down the surface and into the lower part of the washer.

Lined Gas Mains Not Essential

Cleaning, cooling and drying the gas of entrained moisture, therefore, is accomplished in a one-piece apparatus, thus providing gas which may be carried through comparatively small unlined mains to the stoves, boilers, or gas engines. The compact baffle arrangement, as shown in the illustration, permits pressure wash water to be used by reason of the greatly reduced height of the washer. The design further permits the bottom of the washer to be raised to a level sufficiently high to permit the dirty wash water to flow from the washer to the dust catcher-separator, where it picks up additional dust, and from thence to flow into the settling tanks.

Dirty wash water carrying all dust brought down in the gas washer and dust catcher is run by gravity, through straight pipes to the settling tanks. For a modern furnace plant three tanks about 22 feet in diameter or 20 feet square with a depth of about 10 feet on the sides, would be required. They could be located in line with and beyond the dust catcher in most furnace plants. The water enters the tanks through a seal pipe which prevents gas at all times from escaping from the dust catcher with the water. The water passes out into the tank through a perforated distributing pipe and travels at an ever decreasing rate to the side wall of the tank where it overflows. In passing slowly through the tank about 90 per cent of the flue dust in the water is precipitated therein and settles into the steep conical bottom of the tank in the form of a silt-like deposit, or sludge. The water flowing over the weir wall of the tank drops into a trough running around the tank and then flows through a pipe to the sewer, which may carry it to a nearby stream, settling basin, or spray pond if the same water is to be used over again.

As the sludge settles to the bottom of tank to increasing depths, the water to a large extent is displaced by the pressure of the upper mass of material so that at the bottom of the tank where it is removed through the sludge pipe the sludge under proper working conditions would not contain much in excess of 35 per cent water which would permit its being immediately charged into the furnace.

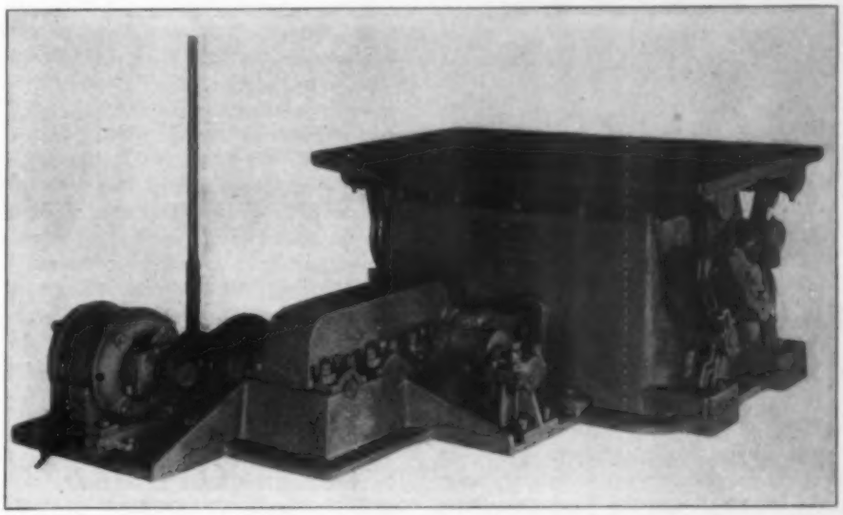
The nature and consistency of the recovered sludge make it possible to charge hydraulically with a high-head centrifugal sludge pump with a power requirement of not more than 5 electrical horsepower running continuously.

The sludge is collected and pumped through comparatively large pipes to reduce abrasion. The sludge enters the top of the furnace through several flat nozzle openings and is distributed uniformly onto the stock just under the large bell. The new charges of stock are dropped in on the sludge layers and any excess moisture in the sludge is absorbed rapidly by upper and lower stock layers thus accomplishing a wetting down of all stock thereby lessening dust production.

Permission for copper mine operating companies in Michigan to manufacture finished products from their output is being sought from the legislature in a bill recently introduced before that body. The measure is designed to afford relief in the copper market and the consequent curtailment of operations. The announcement states 150,000,000 pounds of copper have accumulated as a surplus.

New Molding Machine Is Motor Driven

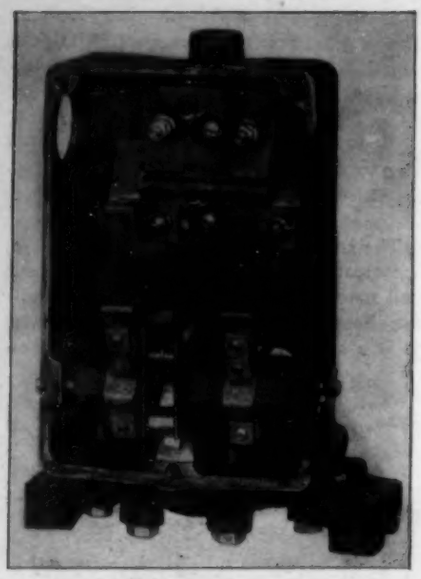
The molding machine as shown in the accompanying illustration, was developed and placed on the market by the American Foundry Equipment Co., New York. It is a self contained unit, the motor being mounted on part of the same base casting as that which supports the train of gears and the operating mechanism. The base on which the jolting table is mounted is a separate casting, but when the machine is assembled the two base castings are bolted together firmly, making the base to all intents and purposes, a one-piece casting.



TOGGLE JOINTED LIFTING ARMS ARE ATTACHED TO THE TABLE CORNERS

A sprocket pinion on one end of the motor shaft is connected by a suitable chain to a sprocket wheel provided with a friction clutch. By means of the long upright lever at the left of the illustration, the operator can control the action of the table to a nicety. A train of gears in the covered gear casing shown, serves to actuate a crank arm attached to a connecting rod which, by means of a suitable cam arrangement on the inside of the table base, imparts an oscillating movement to a central shaft connected at either end to a pair of toggle jointed arms which alternately raise and drop the table.

An alloy, known as manganin, is used extensively in the construction of a standard of electrical resistance because of its low temperature coefficient. The alloy is made of three or four parts of manganese to one of nickel and these compounded with a small proportion of copper.



AS THE PRESSURE RISES OR FALLS, THE SWITCH CONTACTORS ARE OPENED OR CLOSED

Electric Switch Controls Fluid Pressure

A compact pressure regulator of the diaphragm type to be used with motor-driven pumps or compressors controlled by a main line magnet switch or some other suitable starting device recently has been developed by the Cutler-Hammer Mfg. Co., Milwaukee. As shown by the accompanying illustration, the switch has two poles which adapts it for use in connecting small alternating and direct-current motors directly to the line. Overall dimensions are 6 x 6½ x 8 inches, and the mechanism is inclosed.

The air, water or other fluid under pressure is conducted into a chamber in the base of the regulator, the pressure acting against a rubber diaphragm to compress a spiral spring, the normal compression of which can be changed to obtain various opening pressures up to 60 pounds per square inch. When the switch is closed and the pump or compressor operating, the pressure builds up, but when the maxium pressure has been reached, the switch opens to stop the motor. When the minimum pressure has been reached, the switch snaps shut.

Rapid make and break action of the switch is accomplished by an arm carrying a roller which is held in tension against a cam mounted on the operating shaft of the switch. The movement of the adjusting spring is transmitted to the roller which moves along the surface of the cam. When the opening or closing pressure is reached, the roller passes a peak on the cam and gives the latter a quick turn thereby opening or closing the switch. The difference between opening and closing pressure is about 20 pounds.

Designs Lathe for Light Manufacturing Use

For use in light manufacturing and experimental work in training schools and colleges as well as light repair work, a new lathe recently has been developed by the Shepard Lathe Co., Rising Sun, Ind. The new machine, as shown in the accompanying illustration, has a completely inclosed geared head. Either foot power drive, single pulley drive, single pulley countershaft drive or individual electric motor drive can be supplied. In the case of the electric drive, the small motor is mounted on the head-stock, as is shown in the inset, and may be connected to any ordinary lighting lamp socket without additional wiring or power.

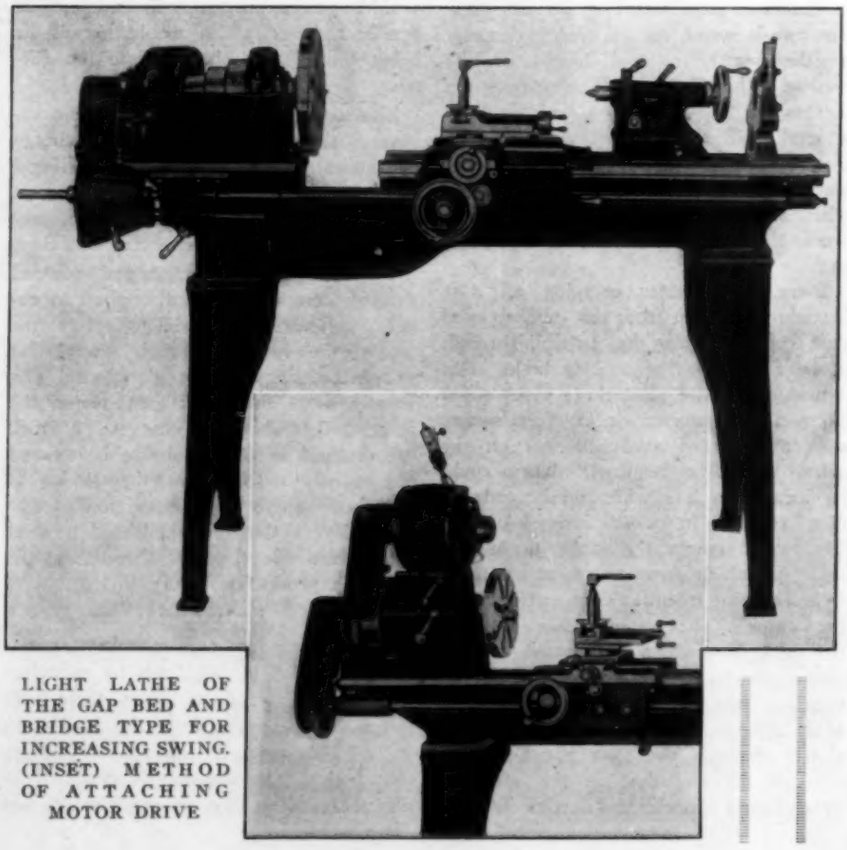
The lathe is mounted either on standard or bench legs. One of the features of the new machine is that where increased swing is desired, a gap bed and bridge is provided, as shown in the illustration. This arrangement increases the swing from 12 to 19 inches for a distance of 5 inches in front of the face plate. The bed is thoroughly reinforced and is stronger at the gap than at any other point in the bed length.

Designs Oil Burner

For general use in machine and repair shops, foundries, ship building plants and steel car building plants, where compressed air is available, the McKneat

THIS BURNER OPERATES ON CRUDE OIL, FUEL OIL OR KEROSENE

Mfg. Co., Easton, Pa., has developed an oil burner for miscellaneous heating. As shown in the accompanying illustration, the outfit consists of an oil tank with pressure gage, the burners, and the necessary connecting hose. For fuel the burner utilizes either crude oil, fuel oil, or kerosene which produce temperatures of 1800, 2500 and 2900 degrees Fahr. respectively. All parts of



LIGHT LATHE OF THE GAP BED AND BRIDGE TYPE FOR INCREASING SWING. (INSET) METHOD OF ATTACHING MOTOR DRIVE

the equipment have been made to withstand hard usage. For use where compressed air is not available, the company manufactures a burner on the vaporizing principle, using kerosene only as fuel. One of the uses for the latter outfit is the thawing out of ore frozen in steel cars.

Machine Cuts Sand Heap and Riddles Sand

A machine developed by the Clement A. Hardy Co., Chicago, is shown in the accompanying illustration. This chine is designed for the same general purpose in that it riddles the entire sand heap in addition to cutting it over. A bucket elevator is mounted on the front of the machine to deliver the sand to a rotary screen which is designed to remove all the gaggers, nails scrap, etc., left in the sand each day after the castings have been shaken out. All foreign material is collected at the back of the screen and afterward dumped at the end of the floor. The screened sand falls between wide lateral grides which form it into a straight, even and uniform sand pile. It is claimed that the best results are obtained by running the machine over the sand pile twice, once before the sand has been wet down and once afterward.

The machine shown in the illustration is electrically driven and is equipped with two speeds. It can be propelled at a slow speed while passing through the sand heap and at a higher speed when traveling from one heap to another. A small gasoline engine may be substituted to furnish the power in the case of foundries which are not wired or connected with an electric power plant. The machine, is available for sale.

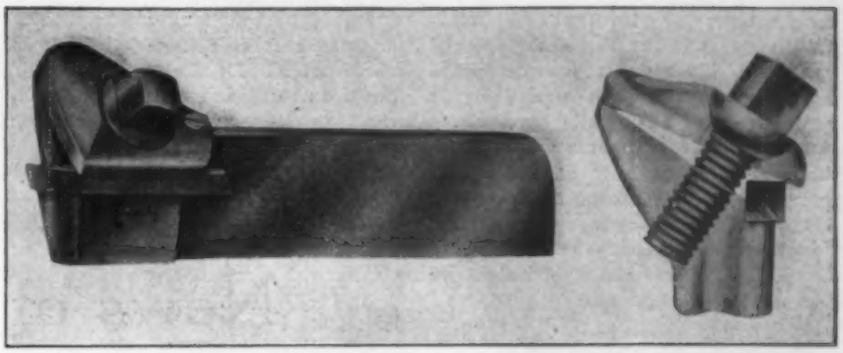


FIG. 1—(LEFT) SIDE VIEW OF TOOL HOLDER OF NEW DESIGN. FIG. 2 (RIGHT) VIEW SHOWING METHOD OF CLAMPING BIT IN HOLDER

Tool Holder Uses Short Bits of Any Shape

For holding old tool bits that have been discarded because of their shortness, the Simmons Economy Tool Corp., Albany, N. Y., has designed a new tool holder, which will accommodate bits of any shape, either straight or tapered. The base of the holder, which is shown in the accompanying illustration, is grooved in such a manner that rocking of the holder in the post is eliminated. Rigidity of the tools is assured by the oscilatting movement of the clamping head on the binding screw and a supplementary screw which may be turned down by hand and used as a third suspension point.

When the tool bit is placed in the holder and the binding screw drawn down tightly by means of a wrench, the center line of the bit is parallel with that of the binding screw. This causes the cap of the tool holder to have a fulcrum so that the bit can not shake or work loose whether running on a job of straight or intermittent cutting. Tools may be changed without removing the holder from the post. The under lip of the holder is undershot without detriment to rake and chip clearance, thus the cutting edge of the tool is supported to its most extreme point. Bits from 1-16 to 7-16 inch in diameter can be clamped in the holder.

BUCKET ELEVATORS LIFT THE SAND TO THE RIDDLE FROM WHENCE IT DROPS TO THE CUTTING BLADES

Install Electric Ovens for Enamel Baking

For baking the enamel on automobile fenders, hoods and similar parts, three installations of electric ovens have been completed at the Cadillac Motor Car Co., Detroit, the Buick Motor Car Co., St. Louis, and the Packard Motor Car Co., Detroit, by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The ovens at the two first mentioned plants are of the continuous conveyor type, the work being hung on an overhead moving conveyor which automatically carries the parts down into the dip tank of enamel, up the drain board, into and through the ovens and progressing through three ovens continually for three coat bakings. These ovens which are maintained at 450 degrees Fahr. by automatic temperature control equipment are of 2000 and 1680 kilowatts capacity respectively.

As a result of much experimentation, progress has been made in developing satisfactory high temperature heat treating furnaces, installations now being available having working

temperatures up to 1800 and even 2000 degrees Fahr. in some special cases. A 120-kilowatt furnace which has been in operation over a year heat treating automobile springs is operated at 1560 degrees Fahr. Tests made at intervals have shown a consumption of 1520 kilowatt-hours for 15,000 pounds of springs treated, the initial temperature of the steel being 70 degrees Fahr. and the weight of the charge 675 pounds.

Canadian Iron Ore Output Lowest since 1900

The output of iron ore from Canadian mines in 1919 was the smallest since 1900. During the 19 years production iron varied between a minimum of 122,000 tons and maximum of 404,000 tons. For many years it has not contributed more than 5 per cent of the domestic requirements in iron.

Shipments in 1919 amounted to 197,170 tons, valued at $693,386, as compared with 211,608 tons valued at $885,893 in 1918. The shipments in 1919 included 321 tons of titaniferous ore mined some years previously at Baie St. Paul on the north shore of the St. Lawrence river, several carloads from properties in Palmerston township, Frontenac county, and Bustard township, Leeds county, Ont., 1200 tons of magnetite shipped from Dean Channel, B. C., to Seattle, Wash.; and the balance from Moose Mountain magnetite mines and the Magpie siderite mine in Ontario. The Magpie siderite mine in the Michipicoten district on Ontario was operated throughout the year by the Algoma Steel Corp., the ore being roasted as usual in the rotary kiln at the mine. About 189,962 tons of roasted ore was produced and shipped to the company's blast furnace at Sault Ste. Marie. The raw ore averaged about 34.3 per cent and the roasted ore about 50 per cent metallic iron.

Moose Mountain, Ltd., operating at Sellwood, Ont., was actively engaged throughout the year in the development of the milling and briquetting processes employed in the treatment of low grade magnetites. The raw ore averaged about 33.8 per cent iron, while the briquettes averaged about 63.8 per cent. Over 100,000 tons of raw ore was milled during the year, but only 5483 short tons of briquettes were marketed. About 25 tons of magnetite was shipped by the British Columbia department of mines, to Vancouver for experiments in electric smelting by the Fleet process.

The quantity of imported ores charged into Canadian blast furnaces during 1919 was 1,674,194 tons as against 2,146,995 tons in 1918. The imported ores in 1919 included 519,722 tons from Newfoundland and 1,154,472 tons from the United States lake district. In 1918 the imported ores included 754,622 tons from Newfoundland and 1,392,373 tons from the United States lake district. The total quantity of imported ores charged to Canadian blast furnaces from 1886 to 1919, inclusive, was 25,314,314 tons. while the total quantity of iron ore shipped from Canadian mines during the same period was 6,264,778 tons.

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

PROFESSIONAL sections of the American Society of Mechanical Engineers will hold individual sessions during the general meeting of the organization at Chicago, May 23-26, at the Congress hotel. The fuel section will consider as its main subject "The Burning of Mid-Western Fuels." An excursion is planned to Milwaukee to visit the new installation of the powdered coal plant of the Milwauke Electric Railway & Light Co. The machine shop section will consider the "Effect of the Automotive Industry Upon Machine-Tool Design and Machine-Shop Practice." Papers will be read before the management section as follows: "Industrial Waste," by L. W. Wallace; "Graphics in Management," by A. H. Burnett; and "Organization of an Engineering Society," by M. L. Cooke. "Design and Construction of Machinery for Road Building," will be discussed before the material handling section. The power section has made tentative plans to deal with power resources and development. The design of large freight locomotives will be discussed at the railroad session.

Preceding the general meeting in Chicago members of the aeronautics section and the Society of Automotive Engineers will inspect the McCook aviation field at Dayton, May 21. Following the meeting in Chicago, an excursion will be made to the Rock Island arsenal with the ordnance section. Friday morning will be devoted to the trip through the arsenal and in the afternoon a technical session will be held.

* * *

Addresses Connecticut Engineers

"The Electric Furnace in the Manufacture of Steel Castings," was the subject of an address by Edwin L. Willson, president of the Connecticut Electric Steel Co., Inc., Hartford, Conn., before members of the Hartford branch of the Connecticut section of the American Society of Mechanical Engineers. The meeting was held in New Britain, Conn., March 14.

* * *

Engineering Advertisers Elect

Officers were recently selected by members of the Engineering Advertisers association at the annual meeting held March 8. Keith J. Evans, advertising manager of Joseph T. Ryerson & Son, Chicago, was elected president to succeed J. J. Arnsfield, advertising manager of the Fairbanks, Morse Co., Chicago. Other officers elected follow: Vice president, Julius Holl, Link Belt Co.; secretary, D. T. Eastman, Eagle-Picher Lead Co.; treasurer, J. H. Patterson, P. H. & F. M. Roots Co. Directors also were named at the meeting as follows: G. S. Hamilton, Conveyors Corporation of America; Edward I. Pratt, Kellogg Switchboard & Supply Co.; Benjamin Brooks, Clay Products association; W. F. Leggett, Webster Mfg. Co.

Convention Calendar

April 20-21—National Metal Trades association. Annual convention, Astor hotel, New York. Homer D. Sayre, Peoples Gas building, Chicago, is secretary.

April 21-23—American Electrochemical society. Spring meeting at the Hotel Chalfonte, Atlantic City, N. J. Joseph W. Richards, Lehigh university, Lehigh, Pa., is secretary.

May 5-6—British Iron and Steel institute. Spring meeting at the Institution of Civil Engineers, Great George street, London, S. W. 1. The secretary is George C. Lloyd, 28 Victoria street, London, S. W. 1.

May 9-10-11—American Association of Engineers. Annual convention to be held in Buffalo. National association headquarters, 63 East Adams street, Chicago.

May 19-20—National Machine Tool Builders' association will hold its spring convention at Hotel Traymore, Atlantic City, N. J

May 23-26—American Society of Mechanical Engineers. Spring meeting, Congress hotel, Chicago. Calvin W. Rice, 29 W. Thirty-ninth street, New York, is secretary.

June 3-4—National Hardware Association of the United States, Metal Branch. Tenth annual meeting at the Cleveland hotel, Cleveland. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Sept. 14-16—National Association of Cost Accountants, will hold its annual convention at the Cleveland hotel, Cleveland. The secretary's address is 233 Woolworth building, New York.

Iron Mining Slowest in Years

Few Mines Being Operated by Independent Interests in Lake Superior District, and Shipping Expected To Start Late—Oliver Company Keeps Up Wages—Manganiferous Ore Miners Insist on Tariff Protection

Special Correspondence

DULUTH, March 21.—Mining operations on the Minnesota ranges are conceded to be at the lowest ebb in several years, and even the most optimistic operators are unable to discern a rift in the clouds. The more cheerful, however, are sanguine that any constructive program formulated by the new administration at Washington will produce results more speedily than is now thought possible and will lead to more activity.

All independent operators have curtailed operations to the lowest possible point, and with few exceptions are confining themselves to development work. A few mines are being operated, mainly with a view to keeping organizations together.

The Oliver Iron Mining Co. is maining its normal winter organization of about 11,500 men. Stockpiling is proceeding and development work is being continued. J. H. McLean, general manager, asserts that he has not received any intimation to the effect that cut in miners' wages is being considered at the United States Steel Corp's. headquarters in New York. It is realized that a reduction in the Oliver wage scale is inevitable, as all the independents have made reductions and are considering further revisions.

Can Make Heavy Shipments

The largest operation of the Oliver Iron Mining Co., this season is stripping at its Spruce and Adams mines in the Eveleth district. Seven steam shovels were employed all winter. The work was started in February, 1916, and 7,250,000 cubic yards of overburden have been removed. The company is employing a force of fully 2000 men in the Eveleth district, and its mines are in condition to make heavy shipments. The company's new concentrator treated over 182,000 tons of ore last season.

The Spring and Silverton properties, east of Mesabi Station, have been leased to the Kingston interests of Eveleth, Minn., and will be stripped. The Spring mine was developed by G. A. St. Clair of Duluth several years for open pit mining, and the Silverton property has been test-pitted It is understood that a plant will be built to wash the hematite ore.

Over 300 men have been employed at the Mesabi Iron Co's. location at Babbitt, on the eastern Mesabi range, in installing equipment for treating the low-grade magnetites of that district. It is expected the mill will be ready for operation early in June. The company cut the wages of its common labor to 46 cents an hour on March 1.

Shipping to Start Late

Mine operators believe the ore shipping season will start late, and that the movement will be slow until midsummer. Basing his estimate on the tonnage now on the Lake Erie docks and in furnaces yards, an independent operator here placed the amount to be shipped from the Lake Superior district in 1921 at 40,000,000 tons.

The operators do not expect prices will be fixed before April 15. They say the basis cannot be intelligently determined until the fundamental conditions likely to govern the trade during the season have been understood. They assume that the railroad freight rate from the mines to the docks will not be changed, but they are counting on a reduction in the vessel freight rate which will be reflected in the ore price.

Interest of mining men on the Minnesota ranges has been centered on the tonnage tax proposals before the Minnesota state legislature. The contention of the operators that the plans proposed would not be constitutional was given consideration by the legislators, and based on the opinion of Attorney General Hilton, the latest proposal is for an occupational tax. It provides a 6 per cent tax on the net value of the ore mined in addition to all the taxes now levied on mining properties. It is estimated that the tax would yield approximately $4,000,000 a year. By a constitutional amendment, it is proposed to place half the receipts from the tax in two permanent trust funds, 10 per cent to be in the permanent university fund and 40 per cent in the permanent school fund. Mining men are opposing the bill, and while it passed the house by a large majority, they have hopes of defeating it in the senate where opposition is much more pronounced.

A bill seeking to impose a tax on royalties received by owners of iron ore lands also is opposed, and it is thought, it will be killed in the senate. The legislators have been bombarded with protests from civic bodies in Duluth and the range towns.

With practically all mining properties on the Cuyuna range closed down, owners of manganiferous ore mines do not see any likelihood of mining being resumed unless they are afforded protection against the competition of foreign ores. At a recent meeting in Duluth, owners of all the manganiferous mines on the range were represented. A resolution was adopted urging the imposition of a duty of 40 cents a unit on importations of ores of 5 per cent or more manganese. George H. Bailey of Washington, counsel for the American Mining congress, explained the bill now before the house at Washington seeking to place a tax of 40 cents a unit on manganese and $1 a unit on ferro-manganese.

Dwight E. Woodbridge, mining engineer, pointed out that the bill would not protect the manganiferous ores on the Cuyuna range. That led to the adoption of a resolution suggesting the specific inclusion of those ores in the bill.

Operations on the Cuyuna range now are confirmed to the Kennedy mine, operating four days a week and the Meacham and the Croft mines, doing development work.

Americans To Build Water System in Tampico

Tampico, Mex., March 17.—American oil interests have agreed to finance the construction of a water supply and distributing system for Tampico, it is authoritatively announced. As a first step toward the improvement the Mexican government has granted a concession to E. E. Thomas, 27 Calle Aurora, Tampico, for piping water from Micos Falls, state of San Luis Potosi, to this city. This pipe line will be 107 miles long. It is estimated that the construction of the pipe line, pumping plants and distributing system will cost $8,000,000. Spiral riveted pipe is being figured on. The diameter will be larger than 16 inches, but just how large has not yet been determined. The line will be laid by the Foundation Co., Tampico.

Employment Is Gaining Slowly

Bureau of Labor Statistics Reports More Workers Engaged in 10 of 14 Basic Industries in February than in January—Extensive Wage Readjustments Revealed in Iron and Steel Industry—Cost of Living Coming Down

WASHINGTON, March 22.—Although not yet certain that business has "turned the corner" and is definitely on the upgrade, developments in the past week have led official Washington to view the business situation more cheerfully than in many weeks. In some quarters it is felt that several months may elapse before the tide toward betterment really runs strong, but the general belief is that if business is not now scraping bottom it is almost there. Some alarm is expressed over the marked decrease in February exports, the dumping of agricultural products by foreign nations, and the drop in initial income tax returns, but on the other hand the signs of improvement are much more numerous as study of the situation will show.

Railroad freight loading, for example, in the first week of March went above the 700,000-car mark for the first time since the middle of December, and developed the first real improvement since last October, when the decline set in. The number of surplus freight cars has dropped from 450,000 to 422,000 in a little over two weeks. This difference is 28,000 cars fewer.

The report of the federal employment service that unemployment had increased only 1 per cent in February over January was heartening in itself, but the bureau of labor statistics goes further by asserting that in 10 out of 14 basic industries employment was actually greater in February than January. This is a fact not generally recognized.

Legislatively, not a great deal of progress has been made. Much difference of opinion still exists as to whether tariff or taxation is to be given the right of way when congress convenes April 11. The administration as a whole leans toward deferring tariff revision, but western representation in both the house and the senate is the strongest in years and leans toward immediate protection for agrarian products. It is probable that the early days of the session will be devoted to interim protection for the farmer and livestock interests with possibly some attention to the lead, zinc, manganese and kindred interests. It is safe to assume that the iron and steel industry, which is not asking for much protection, will receive scant attention early in the session. No real work has yet been done on either a permanent tariff measure or tax revision plan, despite the many proposals advanced in this connection.

Secretary of Commerce Hoover continues to work on plans for aiding industry and extending foreign commerce. It is his opinion that the technicality of still being at war with Germany does not make it inconsistent for the war finance corporation, a government body, to further American trade with Germany. Most of Mr. Hoover's efforts, however, like those of the other departments, are being almost monopolized by the situation presented by the large imports of food products. The preliminary figures for February show February exports to be $489,000,000, against $655,000,000 for January, and February imports to be $215,000,000 against $209,000,000 for January. It is Mr. Hoover's opinion that the January total was too large, through error, but this does not remove all of the sting of an almost $200,000,000 drop in February exports. The statement of Attorney General Daugherty that he will go slow in starting antitrust actions is reassuring to business.

Wage Readjustment Shown

Of the 14 basic industries surveyed by the bureau of labor statistics for February, 10 show increased employment over January and eight reveal increased payrolls. One hundred and fourteen iron and steel plants which were employing 140,511 persons in January and increased to 141,699 in February. Meanwhile the payroll fell from $9,784,692 in January to $9,252,021 in February. The increase in personnel of 0.8 per cent thus was effected with an accompanying cut of 5.4 per cent in payroll, revealing that a definite wage adjustment is going on within the iron and steel industry. Comparing 116 identical iron and steel plants for February, this year and last, this February shows a drop of 24.2 per cent in personnel, and a reduction of 33.2 per cent in payroll, still further proof of adjustment.

Continued recession of wholesale commodity prices is shown for February by the bureau of labor statistics' compilation. The index number for some 327 commodity prices at wholesale, taking 1913 as 100, was 167 for February, against 177 for January and 249 for February, 1920. The index number for metals and metal products was 146 for February, 152 for January and 189 for February, 1920. Farm products, food, cloths and clothing, fuel and lighting, building material, chemicals and drugs and house-furnishing goods all are slipping, the bureau's survey makes plain.

Wage Earners' Cost of Living Drops

The cost of living among wage earners in the United States fell 4.4 per cent during February. It was 76.3 per cent higher on Feb. 1 and 68.6 per cent higher on March 1, 1921, than it was in July, 1914. There was a drop of 17.6 per cent between July, 1920, the highest point reached since 1914, and March 1, 1921. The foregoing figures were compiled by the national industrial conference board, New York. The report of its survey states:

"It should be noted that the percentage of decrease from a higher to a lower base is always less than the percentage of increase from the same lower base to the same higher, although the change in index points is the same in both cases," says the board.

New Jersey Foundries Win Open Shop

The foundries of Newark, N. J., and vicinity which for years have been largely organized, apparently have succeeded in winning their fight for the open shop. All of the plants are working with nonunion men, and while they are on reduced schedules, this is because their order books do not justify operations on a larger scale. At the end of February the foundrymen in Newark, Irvington and nearby towns submitted to their employes a proposal for a wage reduction. In the case of the molders and coremakers the reduction was from 88 to 80 cents an hour. On March 3, 250 molders and coreworkers went out on strike, effectually closing nine foundries.

The Atlas Foundry Co., Dierman, Everett Foundry Co., and the Barnett Foundry & Machine Co., Irvington, applied jointly for a temporary injunction, and an order was issued by the court restraining the union men. As a result, there has been no further disorder. The restraining order is returnable March 29, at which time there will be the hearing on the request for permanent injunction.

Naphthalene Buying

By Drug Trade Fails To Change Prices—Other Markets Dull

New York, March 22.—Drug interests, in order to handle their spring trade, are coming into the market more freely for both spot and ball naphthalene. Prices, however, are unchanged at 8½ cents, f. o. b. works, for flakes, and 9½ cents for balls.

Activity in other products remains largely the same, the buying being for nearby requirements and aggregating a small total. An exception, however, is in the case of motor fuel, of which there has been some buying. Prices are steady. Pure benzol is quoted nominally there has been some buying. Prices are at 30 to 36 cents per gallon, f. o. b. works; 90 per cent benzol, 29 to 34 cents; solvent naphtha 29 to 34 cents and toluol 30 to 36 cents.

While there is a slightly better demand by the fertilizer interests, buying of sulphate of ammonia continues greatly restricted. There is absolutely no contract buying, and but little spot. Small inquiries continue in the market from Java and offerings of $2.75 to $3 for material in double bags at seaboard, are being quoted, but no business has resulted. No inquiries are before the market from Europe.

Coke Oven By-Products

Spot	
Per Gallon at Producers' Plants	
Pure benzol	$0.30 to .36
Toluol	.30 to .36
Solvent naphtha	.29 to .34
Per Pound at Producers' Plants	
Phenol	nominal
Naphthalene, flake	$0.085
Naphthalene, balls	0.095
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.85 to $3
Contract	
Pure benzol	$0.30 to .36
Toluol	.30 to .36
Solvent naphtha	.29 to .34
Per Pound at Producers' Plants	
Phenol	nominal
Naphthalene, flake	$0.09 to .10
Naphthalene, balls	.10 to .11
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	nominal

Enlist State Aid in Basing Point Case

Chicago, March 22.—Efforts of the Western Association of Rolled Steel Consumers and other interests seeking abolition of the "Pittsburgh plus" plan of making quotations on finished steel are being made to obtain backing by the legislatures of various western states.

A resolution memoralizing the federal trade commissioner, was passed recently by the legislature of Minnesota, and a similar joint resolution is being introduced in the Wisconsin legislature this week, and this will be followed by its introduction to the legislatures of Illinois, Iowa, Kansas, Nebraska, North Dakota, South Dakota, Colorado, Utah, Wyoming, Idaho and Montana, and other southern states.

The point to the resolutions is a statement that the facts warrant the issuance of a complaint by the federal trade commission and the attorney general of each of the states is authorized and directed to interplead in the proceedings now pending and such as may follow with respect to the trade practice against which complaint is made. The resolutions embody in substance the complaints made to the commission by the consumers associations.

Schwab Says Germany Will Recover First

Charles M. Schwab, chairman of the Bethlehem Steel Corp., returned March 17 on the OLYMPIC from a six weeks' trip in Europe. Although he visited only France and Italy, he got in close touch with conditions in Germany through talks with manufacturers and economists of that country. He predicted that Germany will be the first European country to get back to normal.

"Germany will recover from the effects of the world war much sooner, perhaps, than any other European country involved in it," he said. "I noted that France and Italy were getting on their feet swiftly, but from the information I obtained I am confident that the world will have to look out for Germany as a possible competitor in much shorter time than is generally allotted to her.

"I believe, however, that the United States need have no fear of being outstripped by Germany industrially, and in regard to shipping I have no doubt that we will still retain the lead we have achieved and are achieving.

"Germany is a conquered country and her people are aware of it, but they are like a strong man who has failed in business and sets his teeth determined to win back what he has lost by hard work and competent management. The secret of Germany's industrial success was the efficiency of her workers. They still have that efficiency and that training that is necessary to win in the world of commerce and manufacture. Business is bad, of course, in Germany, as in all other countries, including America, but it is on the mend."

Mill Near Completion

The first of the principal buildings of the new plant of the Hoosier Rolling Mill Co., Terre Haute, Ind., is nearing completion. Three other buildings, each 100 x 600 feet, will be completed soon. Part of the equipment is now being installed, and includes labor saving devices of all kinds.

Brickmakers

Operating About 25 Per cent—Furnaces Down, Demand Off

Pittsburgh, March 22.—Operations among the manufacturers of refractories are much curtailed due to the continued lack of demand and probably a fair average would be 25 per cent of capacity. Due to continued shutting down of the various furnaces, brick stocks are not disappearing at anything like normal rates. One maker whose continuous kiln was idle for about three weeks now is operating 100 per cent because of inter-company trade. New construction in iron and steel lines, however, is practically nil and what little business is current represents spot needs for repairs. A recent inquiry, for instance, involved only 125,000 brick. Another current inquiry involves five or six carloads of chrome and magnesite brick. Some little activity among malleable furnace operators is reflected in a slight interest in brick of that type. Specifications against estimated requirements are not developing and while at some kilns considerable brick is being stocked, this practice will not continue because of a disinclination to pile high cost brick. Lower prices are being quoted on Kentucky brick although other prices practically are unchanged.

Fire Clay Brick

(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$40.00 to 30.00
Pennsylvania, No. 2	30.00 to 35.00
Ohio, No. 1	40.00 to 45.00
Ohio, No. 2	30.00 to 35.00
Illinois, No. 1	40.00 to 45.00
Illinois, No. 2	30.00 to 35.00
Kentucky, No. 1	36.00 to 40.00
Missouri, high grade	45.00 to 50.00
Missouri, No. 1	35.00 to 40.00
Maryland, No. 1	50.00 to 60.00
Maryland, No. 2	40.00 to 45.00
SILICA BRICK	
Pennsylvania	$45.00 to 50.00
Chicago	55.00 to 60.00
Birmingham	50.00 to 56.00
MAGNESITE BRICK (Per Net Ton)	
9 x 4½ x 2½	$90.00
CHROME BRICK (Per Net Ton)	
9 x 4½ x 2½	$75.00
BAUXITE BRICK (Per Net Ton)	
55 per cent	$35.00 to 50.00
76 per cent	85.00, base

Plant To Resume

The Midvale Steel & Ordnance Co. plans to resume operations in all departments at its Coatesville, Pa., plant in a few days. While the order book for this plant is small, it is understood the company is desirous of giving work to the large force in Coatesville which now has been idle for some time.

February Exports Drop Sharply

Total 25 Per Cent Less than in January and 22 Per Cent Below February 1919—Excess of Exports Still High—Gold Imports Raise Federal Reserve Ratio—General Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

FOR the first time since the readjustment period began, American export valuations in February reflected the great worldwide decline in prices and in business activities. With a total of only $489,000,000, exports have dropped 25 per cent from January of this year and 22 per cent from the total of February, 1920. Not since February, 1918, when exports were valued at $411,000,000, has the total for any month been as low as last month. In contrast with the striking loss in shipments, imports in February gained slightly, the total for the month being $214,000,000 against $208,000,000 in January. From the aggregate value of the same month of 1920, however, a decline of 54 per cent is shown.

Although the sudden turn in the trend of foreign trade has occasioned some alarm among those who fear that America will be made the "dumping ground" for the world's cheap goods, the situation is not yet serious. The excess of exports in February of $275,000,000 while much less than $446,000,000 for January, is still greater than the excess of $178,000,000 reported for February one year ago. Since American prices have fallen more than 25 per cent in a year it is doubtful if the February exports will show an actual decline in volume.

Gold Raises Reserve Ratio

For many months economists have asserted that this country could not continue to pile up a huge monthly excess of exports. Unless something like balance is restored in the country's foreign trade, international commerce and foreign exchanges will remain disturbed. It is now estimated that this country has extended more than $4,500,000,000 of unfunded export credits abroad. Much of this debt is tied up in bank loans and is one of the important factors keeping the money situation tight.

An important development has been the large gold imports in this country, the total for February reaching $43,337,718. Since June the grand total of net imports of gold has been $254,000,000 while the merchandise excess of exports in the same period has been $2,367,889,000. The large inflow of gold has raised the federal reserve system's reserve ratio until it now stands at 51 per cent, the highest since September, 1919. Continue imports of gold may mean easier money and lower interest rate.

Gulf States Profits and Production Increase

Although the business of the Gulf States Steel Co. was seriously affected by the slump in the last quarter, earnings of the company for 1920 after charges and federal taxes were $751,220 against $279,421 in 1919. The year saw a marked expansion in the foreign business of the company. Direct agencies were established in Cuba, Chile, Brazil, Uruguay and Argentina, necessitating increased working capital.

Total output of all products for the year amounted to 1,138,636 tons against 1,037,185 tons in 1919. The company produced 297,863 tons of coal; 70,363 gross tons of pig iron; 156,277 gross tons of ingots; 134,220 gross tons of billets and slabs and 71,399 gross tons of wire rods.

According to President James Bowron, the slump of business in the last quarter compelled readjustment of prices. The prevailing market prices at which the inventory was adjusted as of Dec. 31, 1920, represented a drop of 28 per cent from the summer prices of nails; 35 per cent in bars; and 28 per cent in pig iron. Against this, wages were reduced 15 per cent. Capital expenditures aggregating $957,467 were made during the year. The comparative income account follows:

	1920	1919
Gross profits	$1,153,089	$645,061
Depreciation, taxes, etc.	401,869	365,640
Net profits	751,220	279,421
First preferred dividend	140,000	140,000
Second preferred dividend	5,046	5,142
Common dividend	.....	111,136
Surplus	606,174	23,143

Gives Exchange Basis of Canton Steel Merger

The basis of exchange of securities by the United Alloy Steel Corp., Canton, O., with the present holders of Berger Mfg. Co. and the United Furnace Co., which are to join in a $42,000,000 consolidation, is set forth in a letter to stockholders by President Harry Ross Jones, of the former company. No new financing is proposed under the merger plans. The United Alloy company will authorize $5,000,000 par value 7 per cent cumulative preferred stock and will increase its common stock without par value from 525,000 to 905,000 shares. The basis of exchange is described as follows:

"One and one-tenth shares of new preferred stock of the United Alloy Steel Corp., plus accrued dividends at 7 per cent from Jan. 1, 1921, to the date of exchange, for each share of Berger preferred stock.

"Ten shares of United Alloy Steel Corp. common stock without par value for each share of Berger common stock.

"Eight shares of United Alloy Steel Corp. common stock without par value for each share of United Furnace Co. stock not now owned by the Alloy company.

"The outstanding stock of the three companies in the proposed merger is set forth in the statement as follows:

"The Berger company consists of $6,000,000 divided into 60,000 shares—one half of which is 7 per cent cumulative preferred stock, and the other half common stock.

"The Furnace company consists of $2,000,000 divided into 20,000 shares of common stock, of which your company (Alloy) now owns one half.

"The outstanding stock of your company (Alloy) consists of 525,000 without par value."

Charcoal Iron Co. Cuts Plant Operations

Increasing earnings for the first three quarters of 1920 and a deficit in the fourth quarter are shown by the annual report of the Charcoal Iron Co. of America. The company's statement shows a net profit for the year of $445,563 after deducting $600,000 as reserves for federal taxes, adjustments of inventories, etc. The first three quarters of the year resulted in profits of $225,927, $350,177 and $626,723 for the March, June and September quarters respectively, and a loss of $157,264 for the last quarter.

Production in February, according to figures presented in the report were somewhat under January, although shipments in some products increased. Pig iron production during January totaled 4820 against 3955 tons in February, while shipments were 1326 tons against 1636 tons respectively. In January, 77,783 gallons of alcohol were made and

72,080 gallons shipped, and in February, 66,646 and 81,323 gallons respectively. Payrolls have been reduced 65 per cent.

The company's business suffered a sharp slump in November and December, according to President Frank W. Blair. Pig iron contracts totaling 29,390 tons at attractive prices were carried over into the new year. In 1920 the company produced 93,476 tons of pig iron and shipped 75,459 tons. Shipments in the last quarter dropped to 12,452 tons compared with 27,506 tons in the third quarter. Comparison of the 1920 and 1919 balance sheets follows:

ASSETS	1920	1919
Property account	$10,856,986	$10,419,083
Current assets	4,184,324	2,871,290
Deferred charges	121,614	90,406
Total	$15,162,924	$13,380,780
LIABILITIES		
Capital	$ 8,056,600	$ 8,056,600
Deferred	1,055,186	1,287,468
Current	2,280,241	994,787
Reserves	1,918,721	*1,635,312
Surplus	1,852,175	1,406,611
Total	$15,162,924	$13,380,780

*Included in reserves at the end of December, 1919, was $155,208.86, being the amount of unexpended insurance on Manistique plant. Reconstruction work was completed in 1920 and the above amount was transferred to property account.

Lackawanna Steel Looks for Slow Betterment

The expectation that the general depression in the iron and steel markets will continue well into the current year, during which time reasonable deflation may take place, is voiced in the complete printed annual report of the Lackawanna Steel Co. Lower prices should gradually encourage buying to an extent that will gradually raise operations to normal.

Shipments for 1920 for all products amounted to 1,085,293 tons compared with 603,876 tons in 1919; 1,177,985 tons in 1918; 1,202,494 in 1917; and 1,297,825 in 1916. During the year standard rail production totaled 369,594 tons against 175,712 tons in 1919 and is also in excess of 1918, 1917 and 1916. The company produced 1,359,872 tons of steel ingots. During the year a battery of 60 Solvay coke ovens put in operation.

A net reduction of $270,000 in funded debt is reported for 1920. On account of the price decline the company has written down its inventory $2,830,321, making a total of $17,723,922 against $20,034,453 one year before. Current assets as of Dec. 31 were $34,280,090 compared with $27,891,720 at the close of 1919. Working capital as shown by the balance sheet is $22,598,430 compared with $21,277,000 one year before. Customers' accounts stand at $10,942,583 against $2,704,503 one year ago. This reflects the slowing up of collections. Current accounts payable and payrolls as of Dec. 31 totaled $3,996,985 against $3,945,351 in 1919. Net additions to property account during 1920 amounted to $2,524,596 making a total of $82,938,602. The company's surplus for the year was $2,187,865 making a total surplus of $33,812,601.

Harbison-Walker Reports Slump in Orders

Operations of the plants of the Harbison-Walker Refractories Co., Pittsburgh, are at the rate of about 45 per cent capacity, but the annual report of the company predicts further curtailment unless there is an improvement in business soon. Earnings of the company in 1920 were virtually equal to those one year before. Last year the total for 1920 being $5,009,041 against $5,002,245 in 1919. Following the declaration of a stock dividend of $9,000,000 the surplus of the company at the close of 1920 was $4,882,918 against $12,750,509 one year before. The comparative income account follows:

	1920	1919
Earnings	$5,009,041	$5,002,245
Repairs and taxes	1,289,255	1,921,335
Depreciation & depletion	849,791	866,646
Net earnings	2,869,996	3,981,122
Preferred dividends	495,538	576,000
Common dividends	1,242,049	2,160,000
Surplus	1,132,409	378,477
Stock dividend	9,000,000	.....
Final surplus	4,882,918	12,750,509

The company's balance sheet shows a strong financial position. Inventories increased $200,000 during the year to $1,654,109, but cash increased nearly $1,000,000 to $2,304,657. The company now has $27,000,000 common stock outstanding against $18,000,000 one year ago. In his statement to stockholders, President H. W. Croft says:

"Wage increases during the year averaged 15 per cent. Manufacturing costs during the past five years have increased out of all proportion to wage advances, due to the shortage of efficient labor and the higher freight costs. Orders dropped from 64 per cent of capacity in October to 25 per cent in January and February of this year. As a rule we trail a boom or depression in general business about six months, due to the fact that a large share of our business is well under way, and carries over a corresponding period of time when a depression comes."

Taylor-Wharton Gains

The annual report of the Taylor-Wharton Iron & Steel Co. shows a surplus after charges and federal taxes of $392,045 compared with $268,341 in the preceding year. After payment of common and preferred dividends, the balance was $164,704 compared with $41,000 in 1919; $618,322 in 1918 and $408,183 in 1917. The balance sheet gives the property account of the company at $6,395,703. Inventories as of Dec. 31, were 2,862,849. The comparative income account follows:

	1920	1919
Net income	$670,808	$521,161
Interest	273,775	238,364
Federal taxes	4,988	14,456
Balance	$392,045	$268,341
Preferred dividend	131,341	131,341
Common dividend	96,000	96,000
Surplus	$164,704	$41,000

United States Cast Pipe Earnings Increase

Earnings of the United States Cast Iron Pipe & Foundry Co. for 1920, according to the annual report just made public, amounted to $851,593 compared with a deficit of $503,703 in the preceding year. The net operating income was $1,324,243 against a loss of $76,213 in 1919. The company ended the year in strong financial position, the net working capital being $4,471,658 as compared with $4,080,321 in the previous year. It owns $717,997 in government securities compared with $711,950 as of Dec. 31, 1919. The comparative income account follows:

	1920	1919
Net oper. income	*$1,324,243	†$76,213
Other income	118,328	82,557
Total income	1,442,571	6,344
Depreciation reserve	430,363	424,706
Interest	100,615	85,341
Net income	851,593	‡503,703
Preferred dividends	600,000	600,000
Surplus	251,593	1,103,703

*After maintenance, tax, adjustment of inventory, etc. †Loss. ‡Deficit.

In his statement to stockholders, President L. R. Lemoine said that shipments of the company's products increased over 1919 by 43 per cent. How the irregularity of the demand for pipe is reflected in the company's business is pointed out in the report. Late in 1920, it is said, buying by railroads, municipalities and public utilities virtually ceased.

To Sell Bonds

Proceedings from the sale of the proposed issue of $5,000,000—9 per cent preferred stock and $4,000,000 mortgage bonds by the By-Products Coke Corp., Syracuse, N. Y., it is announced will be used to pay for various improvements, and also to retire the balance of purchase money notes now outstanding. If the stockholders at the special meeting on Oct. 15 vote to authorize the new preferred stock, it is planned to give present holders of common stock the right to subscribe for each share of preferred for two shares of common.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

ARTHUR Schroeder, for 20 years New York representative of La Belle Iron Works, Steubenville, O., and dean of the company's sales force, retired effective March 1, but is remaining with the company for a while in an advisory capacity. He became identified with the iron and steel industry in 1886 when he was made Eastern sales agent of the Standard Iron Co., Bridgeport, O. Prior to that, beginning in 1876, he had been with Manning, Maxwell & Moore and later with Lovejoy & Co. When the Standard company in 1892 was merged with the Aetna Iron & Steel Co., forming the Aetna-Standard Iron & Steel Co., Mr. Schroeder continued as Eastern representative. The Aetna-Standard organization in 1899 was absorbed by the Moore companies, which later were merged with the other companies in forming the United States Steel Corp. Shortly after organization of the Steel corporation, Mr. Schroeder joined the sales forces of La Belle Iron Works.

L. K. Goss has been made manager of the small tool department of the Commercial Steel & Supply Co., Sincere building, Cleveland.

Samuel M. Stone, vice president of the Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., has been elected a director of the Dime Savings bank of that city.

James R. Lowe, sales engineer with the Midwest Engine Co., Anderson, Ind., has ben made general sales manager of the Harrisburg Foundry & Machine Works, Harrisburg, Pa.

Alfred R. Edwards Jr., formerly with the United States Steel Corp. at San Francisco and New York, has joined the Berger & Clark Co., San Francisco, dealer in steel products and machinery, as treasurer.

Charles A. Williams, for 25 years connected with the lake trade, has been appointed lake traffic manager for the Jones & Laughlin Steel Co., Pittsburgh, and the Interstate Steamship Co., with headquarters in Cleveland.

W. N. MacCleary, 2 Rector street, New York, has been appointed district sales representative by the Eastern Rolling Mill Co., Baltimore. John M. Moon has been appointed sales representative in the Philadelphia district, with offices in the Crozier building.

Lesley Powell, for several years sales manager of the Rowe Calk & Chain Co., Southington, Conn., has resigned to accept a similar position with the Tropical Paint Co., Columbus, O.

R. B. Randall has been made manager of southwestern territory for the Blaw-Knox Co., Pittsburgh, and has established offices for the company

ARTHUR SCHROEDER

in the Interstate building, Kansas City, Mo.

Fred C. Metcalf, secretary of the California Metal Trades association, San Francisco, has been made commissioner of the association and J. D. Walberg, assistant secretary, has been made secretary.

S. B. Alexander of Alexander & Garsed, Charlotte, N. C., representatives of the Crompton & Knowles Loom Works, Worcester, Mass., was elected a director at the company's recent annual meeting.

W. A. Letcher, treasurer of the Steel Mill & Foundry Supply Co., Cunard building, San Francisco, has been placed in charge of offices recently opened in the Central building, Los Angeles.

George B. Nisbet, chief metallurgical engineer of the Brier Hill Steel Co., Youngstown, O., has resigned to become production manager of the International Smelting & Refining Co., Erie, Pa.

C. R. Thompson has been made manager of the steel department of Dill-Coppage, Inc., 235 Pine street, San Francisco, the name of which recently was changed from Dill-Crossett, Inc., upon the retirement of N. M. Crossett.

Pliny G. Morrison has been made general manager and treasurer of the Concord Foundry & Machine Co., Concord, N. H., succeeding Ralph G. Benjamin who resigned to become manager of the Ford & Kimball foundry, Concord.

Charles J. Star, head of the planning and engineering department of the New Britain Machine Co., New Britain, Conn., has been appointed assistant superintendent of the machine laboratory in the engineering department, University of Illinois, Urbana, Ill.

George E. Scott, vice president of the American Steel Foundries, Chicago, and F. C. Honnold, president of the Chicago & Big Muddy Coal Co., Chicago, have been elected to the two new directorships authorized in the board of the H. Channon Co., Chicago, dealer in machinery, tools and factory supplies.

J. B. Crane, for the past two years engaged in efficiency studies and service for the W. S. Barstow Management association and the J. G. White Management Corp., New York, has joined the sales and engineering department of the George T. Ladd Co., Pittsburgh, manufacturer of water tube boilers.

Evan F. Jones, who resigned as president and general manager of the Republic Rubber Corp., Youngstown, O., has reconsidered and decided to remain. Mr. Jones formerly had been president and general manager of the Elyria Iron & Steel Co., Cleveland, and at one time was president and general manager of the Clinton-Wright Wire Co., Worcester, Mass., now part of the Wickwire-Spencer Steel Corp.

Belgian Iron

Offered at $35 in San Francisco—Pacific Coast Market News

San Francisco, March 18.—No improvement in the condition of the local iron and steel market is noted. If anything, the general tone is somewhat weaker than a week ago. Only a few scattering sales involving small tonnages have been reported. Optimism, however, prevails and local interests predict that the worst is over.

The pig iron market continues to reflect the depressed condition among foundries and mills. The sum total of business seems to have been one lot of 300 tons of No. 2 foundry placed with an eastern furnace for a foundry in the southern part of the state, and one sale of 1000 tons of Hangyang, China, pig iron for a foundry in this district, at $35 per gross ton, ex-vessel. As an evidence of the indifference of the foundrymen, a firm offer on Luxemburg Foundry iron No. 2 from Belgium at $30 per gross ton ex-vessel, San Francisco, failed to arouse interest. This quotation is the lowest since the beginning of the war and is $5 under the lowest price quoted last week.

The coke market is at a standstill. For the first time since the beginning of the war, Victoria, English, coke has been offered in this territory, but none was booked.

Prices of reinforcing bars range from 2.90c to 4.00c delivered, on the product from the western mills. The Southern California Iron & Steel Co., was awarded the contract for 700 tons of reinforcing bars for a seaplane hangar in San Diego, and it is understood that it went at 2.90c delivered, which figures back to less than 2.70c mill.

A few inquiries for plates are being received. It is reported that 3000 tons of plates and shapes for a steel gas container for the Los Angeles Gas Co. have been placed with Hayward & Bartlett, of Baltimore. Inquiries for plates include two lots of approximately 1000 tons each, one from a local shipyard and one from a northern tank builder.

One independent sheet maker reports booking two small orders aggregating 200 tons of galvanized sheets at 5.00c base, Pittsburgh. Further attempts by some of the independent companies to secure new business has brought out the lowest price yet quoted in this market, one consumer reporting a firm offer received of 4.75c base, Pittsburgh.

New shape business is small, though an increasing number of inquiries are being received from both local and export interests. Several small tonnages have been booked for export to Japan at going prices. The Steel Tank & Supply Co., of Berkeley, was awarded the contract for the erection of several tanks for the Shell Oil Co., and the Shasta Zinc & Copper Co., involving approximately 120 tons of shapes and plates. The Llewellyn Iron Works of Los Angeles, secured the order from the Southern California Edison Co., for a stand pipe which involved 275 tons of shapes and plates.

The first sale of tin plate in many weeks in this market has been reported by one export house, 2000 cases going at 14 yen (normally $9.50) c.i.f. Kobe, Japan.

The scrap market is exceptionally weak. Mills are willing to buy a small tonnage of heavy smelting steel at $12, per gross ton, a drop of about $1.50 a ton. Sales of cast iron are confined to small lots ranging from $30 a ton to $35 a ton. The government sold 3000 tons of shipyard scrap at $8.06, f.o.b., Mare Island.

Local exporters are receiving inquiries for material for immediate shipment. An inquiry for 500 tons of black sheets comes from Kobe, and several others totalling over 2000 tons, for shapes, plates and sheets, have been received from the Orient.

Refractories Makers

Discuss Research and Business Conditions at Two-Day Meeting

Pittsburgh, March 22.—Official action was taken by the Refractories Manufacturers' association at its ninth annual meeting, held at the Pennsylvania hotel, New York, March 17-18, in accepting the standard definitions for clay refractories, adopted by the American Society for Testing Materials last year. This 2-day convention was the most successful ever held by the organization, with over 50 per cent of its membership being present. Applications for membership acted upon at the meeting brought the total to 101, higher than ever before in the history of that association.

In his annual report, President J. D. Ramsay, Elk Fire Brick Co., St. Marys, Pa., made a number of recommendations for the conduct of the association during the coming year, which later were acted upon by the executive committee. Other addresses were made by Dr. E. R. Weidlein of the Mellon institute, Pittsburgh, relative to the importance of research work in the refractories industry and by Professor Whalen of the University of Cincinnati, who delivered an address on business economics and the importance of statistical charts, which he illustrated with his own graphs. Both of these addresses aroused considerable interesting and valuable discussion. At Thursday afternoon's session, a round table discussion took place with reference to business conditions in various centers, and the consensus of opinion seemed to be that from the present outlook, judged from sane and conservative standards, not much improvement can be expected for several months.

By the election of F. J. Helwick, Pueblo, Colo., and E. M. Durant, Los Angeles, to the executive committee, two additional districts, making 10 in all, were created. Mr. Helwick will represent the refractories manufacturers in Colorado and Utah and Mr. Durant will represent the Pacific coast makers.

Officers were re-elected and installed on Thursday morning, as follows: President, J. D. Ramsay, Elk Fire Brick Co., St. Mary's, Pa.; vice president, John L. Green, LaClede-Christy Clay Products Co., St. Louis, Mo.; treasurer, C. C. Edmunds, McLain Fire Brick Co., Pittsburgh; and secretary, Frederic W. Donahoe, 840 Oliver building Pittsburgh.

In addition to the Refractories Accountants' institute recently formed by this association it was decided at this meeting to organize a Refractories Operatives institute, and a committee was appointed of which Arthur P. Taylor of Charles Taylor Sons Co., Cincinnati, is chairman. Another committee appointed at this gathering is the fuel conservation committee, of which S. M. Kier of the Kier Fire Brick Co., Pittsburgh, is chairman. Committee chairmen reporting at one of the sessions of this annual meeting included: J. D. Ramsay, committee to co-operate with committee C-8 of the American Society for Testing Materials; R. D. Matton, committee to co-operate with government officials on standards and specifications; D S. Parry, committee on liability and compensation insurance; Porter S. Kier, committee on fellowship at the Mellon institute; J. J. Brooks Jr., committee on standardization; and R. P. M. Davis, committee on open shop. Several other progress reports were read.

Metal Trades To Meet

Dr. Charles Aubrey Eaton, of *Leslie's Weekly*, will be the principal speaker at the fifteenth annual dinner and business meeting of the Indianapolis branch National Metal Trades association, Thursday evening, March 31, at the Claypool hotel. He will speak on "The Real Labor Problem." Motion pictures of two "industrial dramas" will be shown and officers will be elected. Fifteen hundred invitations have been sent to metal trades manufacturers, employers, business men and public officials of Indianapolis and other cities in Indiana and adjoining states.

Small Buyers Import More Steel

American Exporters Distribute Output of Mills More Evenly in January—Rails, Plates and Structural Shapes Shipped in Larger Volume to Countries Hitherto Not Principal Consumers—Mexico Takes Pipe Tonnage

STUDY of January's exports of iron and steel by destinations shows a more even distribution of the products among the consuming countries and reflects in a degree the world wide requirements of steel. In January, as in other months, some countries took larger tonnages compared with others, but in the main the allotments were more nearly proportionate than has been the case for some time.

Products such as pig iron, semifinished material and barbed wire, which were exported in comparatively small amounts, especially the two former lines, showed decided decreases from the earlier comparative periods and do not afford as much opportunity for this study as do some of the other materials now being taken in greater volume.

For example, France, Cuba, Brazil, and Japan in January last year were shipped 33,687 tons of steel rails, leaving 10,762 tons for distribution among the other nations requiring this product. Last January the four countries took only 25,207 tons of the 59,739 tons exported, leaving 34,532 tons to all others.

In plates, France, Italy, the United Kingdom, Canada and Japan took 64,327 tons in January, 1920, out of 75,587 tons shipped out of the United States and this year received 73,189 tons out of 107,170 tons exported. Thus in January, 1920, only 11,260 tons were available for countries other than the five named, while this year the amount was greater by more than 22,000 tons.

Foreign purchasers in France, Canada, Cuba, Argentina and Japan received 19,947 tons of structural shapes in January, last year, out of a total export tonnage of this product of 27,550 tons. This year in January the same five countries received 34,964 tons, but nearly 40,000 tons remained for other nations.

Outstanding purchases in January were 28,393 tons of welded pipe by Mexico, as against 1126 tons in January a year ago; 18,238 tons of plates to France, compared with 1748 tons in January, 1920; 2033 tons of pig iron to Canada, as against 881 tons a year ago; 27,691 tons of plates to Canada, compared with 12,265 tons last year; 13,859 tons of structural shapes to Canada against 5470 tons in January 1920.

At a conference of manufacturers at Perth Amboy, N. J., a general reduction in the wage scale effective throughout Middlesex county, N. J., was justified by most of the manufacturers represented.

Steel Exports to Principal Foreign Consumers

PIG IRON

	Belgium	Italy	United Kingdom	Canada	Japan	All countries
January, 1921....	556	....	34	2,033	....	3,926
January, 1920....	2,620	50	....	881	6,437	18,468
December, 1920..	....	421	2,444	5,446	....	10,055
December, 1919..	....	500	1,281	1,911	4,590	14,612
November, 1920..	300	1,994	844	6,733	....	13,920
November, 1919..	....	305	3,645	1,242	12,239	21,429
1921 to date.....	556	....	34	2,033	....	3,926
1920 to date.....	2,620	50	....	881	6,437	18,468

BLOOMS, BILLETS AND INGOTS

	Belgium	France	Italy	United Kingdom	Canada	All countries
January, 1921....	....	26	13	140	31	315
January, 1920....	1,312	1,804	3,926	12,206	115	19,937
December, 1920..	....	....	100	2,610	678	3,415
December, 1919..	....	....	7,514	9,901	423	21,538
November, 1920..	50	1	....	6,027	792	7,042
November, 1919..	....	360	197	11,054	292	13,211
1921 to date.....	....	26	13	140	31	315
1920 to date.....	1,312	1,804	3,926	12,206	115	19,937

STEEL PLATES

	France	Italy	United Kingdom	Canada	Japan	All countries
January, 1921....	18,238	3,605	22,759	27,691	3,896	107,170
January, 1920....	1,748	922	16,175	12,265	33,217	75,587
December, 1920..	4,887	5,093	18,444	23,393	4,570	114,547
December, 1919..	152	4,495	3,315	15,994	11,079	46,743
November, 1920..	3,609	1,189	17,363	21,728	3,433	79,420
November, 1919..	747	5,300	1,479	11,868	30,345	63,680
1921 to date.....	18,238	3,605	22,759	27,691	3,896	107,170
1920 to date.....	1,748	922	16,175	12,265	33,217	75,587

STRUCTURAL SHAPES

	France	Canada	Cuba	Argentina	Japan	All countries
January, 1921....	6,451	13,859	8,454	1,803	4,397	74,737
January, 1920....	1,081	5,470	3,128	1,834	8,434	27,550
December, 1920..	1,931	18,650	8,605	2,721	5,579	63,496
December, 1919..	339	5,433	2,721	675	1,399	15,610
November, 1920..	924	9,275	5,858	8,047	1,971	42,839
November, 1919..	2,752	4,952	3,204	1,919	2,675	22,939
1921 to date.....	6,451	13,859	8,454	1,803	4,397	74,737
1920 to date.....	1,081	5,470	3,128	1,834	8,434	27,550

BLACK SHEETS

	France	Canada	Argentina	Brazil	Japan	All countries
January, 1921....	451	5,972	1,723	1,075	2,198	18,291
January, 1920....	477	5,207	105	107	3,176	10,032
December, 1920..	402	6,717	2,391	926	1,009	17,729
December, 1919..	....	4,758	310	75	1,626	8,148
November, 1920..	383	5,787	2,741	521	1,807	16,063
November, 1919..	281	4,074	873	261	6,303	13,146
1921 to date.....	451	5,972	1,723	1,075	2,198	18,291
1920 to date.....	477	5,207	105	107	3,176	10,032

STEEL RAILS

	France	Cuba	Brazil	Japan	All countries
January, 1921.....	365	8,539	9,707	4,596	59,739
January, 1920.....	3,114	8,388	6,912	15,273	44,449
December, 1920.....	72	5,884	2,211	3,466	52,986
December, 1919.....	431	4,638	86	10,496	34,149
November, 1920.....	....	16,288	10,182	1,817	67,708
November, 1919.....	3,362	6,680	1,299	24,168	54,336
1921 to date.....	365	8,539	9,707	4,596	59,739
1920 to date.....	3,114	8,388	6,912	15,273	44,449

TIN PLATE

	Canada	Brazil	China	Hongkong	Japan	All countries
January, 1921....	2,211	2,833	491	1,185	6,691	35,543
January, 1920....	4,529	1,481	1,357	2,084	8,373	20,579
December, 1920..	4,412	2,581	2,387	173	1,898	20,943
December, 1919..	3,946	510	1,504	309	5,732	15,372
November, 1920..	3,426	1,427	3,469	144	951	15,423
November, 1919..	4,332	679	1,937	230	9,059	18,934
1921 to date.....	2,211	2,833	491	1,185	6,691	35,543
1920 to date.....	4,529	1,481	1,357	2,084	8,373	20,579

WELDED PIPE

	Mexico	Cuba	British India	Dutch E. Indies	Japan	All countries
January, 1921....	28,393	3,469	7,628	2,651	2,477	72,995
January, 1920....	1,126	736	53	349	6,213	14,827
December, 1920..	15,620	2,593	2,808	1,277	992	39,636
December, 1919..	2,767	936	1,524	358	1,377	11,602
November, 1920..	10,238	2,338	1,444	2,370	432	25,315
November, 1919..	2,747	937	1,132	371	2,723	15,151
1921 to date.....	28,393	3,469	7,628	2,651	2,477	72,995
1920 to date.....	1,126	736	53	349	6,213	14,827

BARBED WIRE

Period	Canada	Cuba	Argentina	Brazil	Colombia	All countries
January, 1921....	100	354	1,857	2,615	288	9,756
January, 1920....	441	433	1,035	1,821	760	5,881
December, 1920..	1,052	481	2,505	3,438	567	13,930
December, 1919..	1,923	1,621	1,461	2,446	624	10,158
November, 1920..	3,141	1,295	3,915	3,341	308	15,507
November, 1919..	803	1,958	1,943	1,802	615	8,665
1921 to date.....	100	354	1,857	2,615	288	9,756
1920 to date.....	441	433	1,035	1,821	760	5,881

Urges War Basis for Industries

Bernard M. Baruch, in Final Report of War Industries Board, Recommends Freer Association of Manufacturers with Government Supervision To Offset Potential Evils—Priorities Greatest Achievement

WASHINGTON, March 22.—Permanent combinations or associations of industry under government supervision, involving a radical change in the present attitude of the government toward such groups is urged by Bernard M. Baruch, chairman of the war industries board, in a final report of that wartime organization. This is one of the conclusions of the board resulting from its experience during the war.

The present governmental policy of enforced isolation of industries and costly competition is not conducive to the general welfare, according to Mr. Baruch's report. It is held that great public benefits in the way of prices and abundance of goods, resulting from economies in production and distribution, are capable of being effected through co-operation of members of industrial groups.

To offset potential injustices which would come through such organizations, the report recommends the creation of some governmental agency which shall supervise the associations, both for the purpose of promoting their beneficient possibilities and of checking against any measure of their powers. Recommendation also is made for the maintenance of a skeleton organization along the lines of the war industries board.

The report is issued in book form from the government printing office, and is entitled *American Industry in the War.*

Not a Slacker in Industry

American industry is praised for its whole-hearted co-operation, there being "not one slacker" in the whole business world. Due to this co-operation "not one default was recorded on any demand made by the military establishments" of the war industries board. The origin of the war industries board in the council of national defense, is traced in the book.

Much credit is given to the board's functions in solving the complex problem of industrial mobilization through introducing order and definiteness into requirement programs and systematically comparing them with reliable inventories of resources and facilities, but the rise of the priorities principle and its elastic and adaptive application are held to be the greatest achievement. It was, in the words of the report, "destined to become the most characteristic and dominating feature of the whole scheme of war time supervision over the industrial forces."

The success of the conservation program, says the report, was largely dependent on the establishment of priorities. In the canning industry alone it saved 260,000 tons of tin plate annually through substitutions. The mere insistence that manufacturers of thread should wind 200 instead of 150 yards on each spool, released 600 freight cars a year. Eliminating the use of tin for putting the rustle into silk saved 50 tons of invaluable metal. Packing certain dry goods in bales instead of boxes saved 17,312 carloads of freight space, 140,000 cartons and nearly half a million wooden packing cases.

The chapter on price fixing describes the chaotic market conditions brought about by government buying on an unprecedented scale in a limited field of supply and points out that the corrective action of the law of supply and demand was nonexistent in the conditions that prevailed.

As with many of the other procedures of the war industries board there was little or no direct legislative authority for price fixing, but the powers vested in the President, the army and navy, the food administration, the war trade board, and the shipping board, the railway administration, etc., were available in enforcing price fixing. The reports hold price fixing was necessary not only for the protection of the government and the public against exorbitant prices but as a means of stabilizing industry and stimulating, through assured fair prices, abundant production.

In steel, for example, the deport declares, the result of price fixing was to reduce ship plates from $12 to $3.25 per 100 pounds, pig iron from $60 to $33 a ton; coke from $12.75 to $6; copper from 37 cents to 16.57, 23.5 and 26 cents per pound; and zinc from 22.50 to 12 cents a pound. The report does not attempt to estimate the savings either to the government or the public from price fixing.

The chapter on the foreign mission gives an illuminating account of how the American system of price control was adopted internationally to a large extent. One purpose of the mission was to secure from the allies, particularly the British, reciprocity in price and allocation of necessary materials. Before this mission went abroad the United States was giving the allies the benefit of prices established for itself, but was not receiving reciprocal treatment in such essential foreign commodities as tin, jute, and wool.

The second part of the report is devoted to an exhaustive study of the 57 commodity sections, which were the agencies through which most of the general functional activities of the board in price fixing, priorities, conservation, etc., were concretely applied. In the second part, the work of the board, as differentiated from general policy and principle, is described. Here is set forth in detail the dealing with the industrial problems afforded by iron and steel, copper and brass, the nonferrous metals, nitrate, toluol and other chemicals for munitions, industrial chemicals, forestry products and building materials, tools, transportation and power, textiles, leather and rubber, machinery, etc. These as well as the 44 related appendices afford a vast reservoir of original material for the student of wartime history and economics.

Need Preparedness Measures

In conclusion the report declares that the board had finally developed a scheme of positive control over the major portion of the industrial fabric. It is declared the experience of the war industries board shows the need of three preparedness measures against some future war. These are (1) a peacetime skeleton organization following the lines of the war industries board, which would keep the government in touch with industry, so that the resources and facilities of the nation, adaptable to war purposes, should be an accurately known quantity and the nucleus of their emergency control be at all times ready to expand; (2) the stimulation of the domestic production of such military necessities as nitrogen, coal tar derivatives, etc., of which there is a complete lack or a serious shortage; and (3) certain war industries should be encouraged to maintain skeleton organizations through which they could rapidly expand the production of guns, airplanes, munitions and other direct military equipment.

Obituaries

EDMUND D. Brigham, assistant freight traffic manager for the Chicago & Northwestern railroad, died March 5 at the Union Leage club, Chicago from an attack of heart trouble. He was 65 years old. In his capacity as traffic manager he had charge of the large operations of the railroad at Duluth and other upper lake ports where ore traffic is heavy and thus was well

EDMUND D. BRIGHAM

known to ore producers and shippers in the northwest. He was possessed of wide knowledge of this business and was an authority on the subject. He entered the employ of the Northwestern 48 years ago as a telegraph operator and 39 years ago was promoted to a position in the general offices at Chicago. During the great war he was a district manager at Duluth for the United States railroad administration, resuming his former position with the company when the administration gave over its control of the road.

David W. Payne, retired captain of the United States army, died recently at his home in Brooklyn, aged 80 years. He was editor of *Steam*, author of *Foundry Practice*, inventor of the Payne automatic engine, and a son of the founder of B. W. Payne & Son, engine builders.

Andrew Corcoran, retired manufacturer of wind mills, died at his home in Jersey City, N. J., March 9. He formerly was president of the board of trade of Jersey City. He was born in Ireland 83 years ago.

Robert Martindale, former president of the Shirley Radiator & Foundry Co., Indianapolis, and one of the founders of the National Motor Car & Vehicle Corp., Indianapolis, died recently at his home. He was 59 years old.

Francis R. Upton, former associate of Thomas A. Edison and the first president of the Edison Pioneers, died March 10 at his home in Orange, N. J. He was born in Peabody, Mass., July 26, 1852.

Gordon Anderson Roper, manager of the American Trading Co. in Japan, died March 15 at his home in Pelham Manor, N. Y., of a complication of diseases. Mr. Roper was 32 years of age and was a graduate of Williams college.

Charles G. Stoddard, founder of the Stoddard-Dayton Automobile Co., Dayton, O., and later vice president of the United States Motors Co., New York, died recently in Galveston, Tex., following an operation. He was 57 years old.

Addison S. Hodges, who has been a leading figure in the foundry and hardware business in Worcester, Mass., for two generations, died recently at 90 years of age. Mr. Hodges was for 70 years engaged in the foundry business.

Robert L. Goldsworthy, a superintendent for the Illinois Steel Co., at South Chicago works, died recently at his home in South Chicago, at the age of 60 years. Death followed the extraction of a tooth several days previously.

Charles French Bartlett, vice president of Bartlett & Co., Inc., Philadelphia, heaters and ranges, died at his home in Philadelphia March 12. He was 73 years old. He had been engaged in the heating business nearly 50 years, having started with his father, the late Job Bartlett.

John M. Starr, treasurer of the Starr Brothers' Co., East Hampton, Conn., maker of bells, died unexpectedly at his home in that town, March 16, aged 75 years. He had been identified with the industry since he was 17 years old. His son, Ambrose M. Starr, is president of the company.

Calvin Tompkins, former city dock commissioner, New York, at one time president of the Material Handling Machinery Manufacturers' association, and president of the Tompkins Cove Stove Co., Tompkins Cove, N. Y., died March 15 in a hospital in New York, following a long illness. He was regarded as an authority on terminal facilities and port development. During the war he was a member of the Federal inland waterway commission and a member of

J. B. McKENNAN

Vice president and general manager of the Colorado Fuel & Iron Co., who died recently in Denver

the advisory committee of the port and harbor facilities commission. Mr. Tompkins was born in East Orange, N. J., in 1858 and was graduated from Cornell university in 1879.

Henry W. Minnemeyer Sr., aged 81, who since 1897 has been affiliated with the financial department of W. P. Snyder & Co., Pittsburgh, died at his residence in that city March 15 after a brief illness. Mr. Minnemeyer was born in Pittsburgh and has been a life long resident of that city. In 1862 he became identified with the iron and steel industry with his father-in-law, Samuel Reynolds, under the firm name of Samuel Reynolds & Co., with a plant in Allegheny, Pa. After the death of Mr. Reynolds in 1877, the company's name was changed to W. H. Minnemeyer & Co., and Mr. Minnemeyer continued in active charge until he retired in 1897 to go with W. P. Snyder & Co.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

FORMERLY known as the Powdered Coal Co., and prior to that as the Combustion Economy Corp., 1901-11 South Rockwell street, Chicago, the organization will hereafter do business under the name of the Grindle Fuel Equipment Co. The capital stock of the organization has been increased to $1,000,000, and plans are now being prepared for the erection of a manufacturing and demonstrating plant, consisting of a foundry, machine and sheet metal shop, office and engineering department, a complete powdered coal preparation plant and other departments necessary for the manufacture of powdered coal equipment. The plant will utilize powdered coal for fuel and a conveying system and firing equipment, will be installed. It is expected the plant will be located in Chicago and it is hoped it will be ready for operation the latter part of this year.

* * *

BIDS have been taken by Alfred Box & Co., Inc., Philadelphia, on the erection of an office and pattern shop building, and bids will shortly be opened on a machine and structural shop, to be 110 x 300 feet. The company, which manufactures cranes and traveling equipment, will move to its new plant when it is completed. It is not in the market for equipment.

* * *

BUILT of glass, steel frame and brick construction, the new plant of William W. Nugent & Co., Chicago, will be 2-stories, 50 x 128 feet. It will have a steam heating system, and will be equipped with welding furnaces, nickel plating and sheet metal machinery. The company manufactures oil filtering systems, oil filters, oiling devices, tanks and oil pumps.

* * *

ON A PLOT of eight acres in Orangeville, Baltimore, the Wizard Check Endorser & Printing Machine Co., Inc., 457 Calvert building, Baltimore, plans to erect a plant, consisting of 10 buildings, to be devoted to the manufacture of check endorsers and printing machines. All buildings will be 1-story, and approximately 70,000 square feet will be under cover. All structures will be of modern factory construction and design. New equipment will be required, including power punch presses, small machines, shapers, drilling presses, etc. In addition the company will require power plant equipment as well as the necessary equipment for its water resources, including pumps, tanks, etc. Officers of the company, which is capitalized at $3,000,000 are: President, F. S. Weise; vice president, R. Norman Cadle and secretary, John H. Hessey.

* * *

ORGANIZATION of the Virginia Kleenwae Mfg. Co., Inc., Richmond, Va., manufacturer of automatix bottle drink service machines, etc., recently was completed and the company has been incorporated with $75,000 capital stock. At the present time the company does not plan to erect a plant as it has contracted to have its products manufactured by an established company.

* * *

TO MANUFACTURE a precast reinforced, sectional, concrete culvert, the Nelson Concrete Culvert Co., Hattiesburg, Miss., recently was incorporated with $100,000 capital, by B. R. Thompson, W. J. Butler and R. J. Orr, all of Pontiac, Ill. The company advises work has been completed on its plant at Hattiesburg, all equipment ordered, and work is expected to be started within a few weeks.

* * *

PLANS are being completed for the erection of a small building for Morton McI. Dukehart & Co., Baltimore, which when completed will be devoted to small jobbing work in iron castings. The company will require some foundry equipment, but as work on the proposed structure is not contemplated for some time, purchases will not be made until actual construction has been decided upon.

* * *

CONTRACT has been awarded by the Chemical Products Co., Ltd., Toronto, Ont., for the erection of an acid phosphate plant at Trenton, Ont. This plant will consist of a rock storage building with a capacity of about 7000 tons, a mill building for the handling of dust and acid, and a steel crane type acid phosphate storage building. The plant is designed for an ultimate capacity of 100 tons a day, but about half of this capacity will be possible in the buildings to be constructed at this time. The present plant during the war was a British chemical munitions plant. The sulphuric acid plant is now in operation and has a capacity of 120 tons a day. Plans for the plant have been completed and construction work is to be completed in time to manufacture acid phosphate for fall requirements. The Austin Co., Cleveland, has the contract for designing, constructing and equipping the plant complete. A total expenditure of about $400,000 is involved, it is estimated.

* * *

TO ACT as a sales organization in the distributing of oil heaters manufactured by the Motors Metal Mfg. Co., Detroit, the Superior Stove & Stamping Co. recently was organized with $1000 capital stock. The Motors Metal Mfg. Co., officers of which are the same as those of the Superior Stove & Stamping Co., has an authorized capitalization of $600,000, of which more than $500,000 has been paid in.

* * *

IN ORDER to assist the Canadian trade in the development of the automotive industry, the Splitdorf Electrical Co., Ltd., 469 Yonge street, Toronto, Ont., recently was incorporated. Officers of the company are: President, R. W. Sutherland, vice president and general manager of the Splitdorf Electrical Co., Newark, N. J., which is the parent organization; treasurer, J. J. Fisher and vice president and general manager, C. K. Nelson. The company will not do its own manufacturing, but will act as a selling agency.

* * *

METAL stampings of all kinds will eventually be manufactured by the Honk Falls Knife Co., Inc., Napanoch, N. H., which was recently incorporated with $10,000 capital, but for the present it will confine its activities to the making of pens and pocket cutlery. Equipment has been purchased and the company is now only in need of a power or foot press. No plant will be erected as the factory building formerly occupied by the Napanoch Knife Co. has been leased. Directors of the company are John J. Cushner, Melvin Schoonmaker, Wilson Quick and George F. Brackley.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

PURCHASE of a 10-acre tract in Hudson, N. Y., on the main line of the Boston & Albany railroad, has been made by the Holbrook Co., New York, and the company plans to utilize the land as a site for a large plant to be devoted to automobile body building. At present the company has one unit under construction, which will be 1-story, 100 x 260 feet, and it is expected this structure will be ready for operation by May 1. Other structures to be erected will cover from 100,000 to 150,000 square feet of floor space, each. It is the company's intention to discontinue to a great extent, the manufacture of custom bodies in single or small orders, and go in for quantity production in lots of possibly 50 to 100 bodies of a kind.

* * *

THE Midvale Steel & Ordnance Co., Philadelphia, has placed an order with Arthur G. McKee & Co., Cleveland, covering the furnishing of a revolving distributor for its No. 1 blast furnace at Coatesville, Pa.

* * *

IN ORDER to take up outstanding notes, money from which was used for the installation of additional boilers and stokers, and the erection of a coal plant, railroad track, etc., the Worcester Electric Light Co., Worcester, Mass., plans to increase its capital stock from $2,000,000 to $2,400,000.

* * *

ERECTION of a new plant and the purchase of additional equipment is planned by the Imperial Japanning & Enameling Works, 408-418 West Grand avenue, Chicago, which was recently incorporated with $100,000 capital stock. Officers of the company are William W. Link, John A. Skailand and Joseph V. Janda.

* * *

ADVICES have been received to the effect the Wholesale Equipment & Supply Co., 1002 Farmers Bank building, Pittsburgh, has been reorganized and will in the future do business under the name of the Sterrett-Riethmiller Co. The company will continue handling the line formerly dealt in by the Wholesale Equipment & Supply Co. Officers are: President, D. R. Sterret and vice president, LaVerne Riethmiller. New offices have been established in the Martin building.

* * *

UNDER the name of Westerman & Co., Inc., Lockport, N. Y., reorganization of Westerman & Co., manufacturer of bar iron., etc., recently was effected. Officers are: Chairman of the board Calvin G. Sutliff; president and treasurer, Gilbert T. Sugden and vice president and manager, Charles F. Magoffin.

* * *

CAPITALIZED at $100,000, the Pyramid Truck Co., Canton, O., which was recently incorporated, will engage in business dealing in motor trucks and parts. In addition the company will operate a general automobile rebuilding and repair department. It has leased a 3-story concrete brick garage building, housing approximately 33,000 square feet of floor space.

* * *

TO PROVIDE additional working capital and to better care for its rapidly growing business, the Master Electric Co., Dayton, O., recently increased its capital stock from $100,000 to $150,000. The company which was formed in March 1920, has developed a large business among appliance manufacturers. Officers are: President, E. P. Larsh; treasurer, S. A. Brown and secretary, R. S. Shonk and vice president and sales manager, F. O. Kirkpatrick.

* * *

OFFICERS were recently elected at the board of directors' meeting of J. H. Williams & Co., manufacturer of drop forgings and tools, with works at Brooklyn, Buffalo, Chicago and St. Catharines, Ont. They are: President, J. Harvey Williams; vice president and general manager, A. D. Armitage; second vice president, Frank W. Trubold; secretary and treasurer, W. A. Watson; controller and assistant treasurer, H. S. Baldwin and assistant secretary, C. B. Harris.

* * *

AT THE annual meeting of the stockholders and directors of the American Hardware Corp., New Britain, Conn., the following officers were elected: President, Henry C. M. Thomson; first vice president, Charles Glover; vice presidents, B. A. Hawley, C. H. Baldwin and Charles B. Parsons; treasurer, I. D. Russell; assistant treasurer, G. Ernest Root; secretary, George T. Kimball and directors, C. H. Baldwin, Philip Corbin, James S. Elton, Charles Glover, B. A. Hawley, George T. Kimball, Charles B. Parsons, Andrew J. Sloper, Charles F. Smith, Henry C. M. Thomson, Harris Whittemore and Meigs H. Whaples.

* * *

COMPLETION of a new plant building by July 1 is expected by the Tunnessen Mfg. Co., Hazleton, Pa., which has advised that it has contracted for all necessary materials, etc. This building will be 2-stories, 48 x 170 feet of fireproof construction. The Phoenix Bridge Co., Phoenixville, Pa., has the contract for the structural steel and the J. S. Thorne Co., Philadelphia, will furnish the steel sash, glass, etc. G. S. Stecker has the contract for the concrete work. In addition the company has contracted for all necessary equipment. It manufactures lamps, sewing machine belt hooks and sheet metal products.

* * *

THE Norton Co., Worcester, Mass., has decided to sell its grinding machines direct to the trade and not through jobbers, as has been the custom since the establishment of this division of the company. Contracts with dealers have been closed, and in the meantime agencies have been established by the company in the chief distributing centers of the country. The exceptions to this rule are the Pacific coast and the extreme south. The New England territory will be covered from the main office. The new district managers are: New England, George C. Montague; New York, Harry Harding, recently European representative who has been brought back to America to fill the important post in the metropolis; Chicago, Hiram N. Cudworth; Detroit, Oscar Knight; Cleveland, Oscar E. Nordstrom; Pittsburgh, Paul R. Hawkins; Philadelphia, Paul Hoffman. The other offices will be in charge of district agents as follows: Indianapolis, Walter Rogers; Syracuse, Walter Cook; and Hartford, Conn., Henry Peckham.

Southern Output

Greatly Curtailed by Steel Corporation —Plans Large Fabricating Plant

Special Correspondence

Birmingham, Ala., March 21.—Announcement is made that the Tennessee Coal, Iron & Railroad Co., of Birmingham, has reduced operations from an 80 to a 50 per cent basis. At Ensley, five blast furnaces are making basic, one furnace in Bessemer is on foundry and another on ferromanganese. This reduces the company's active blast furnaces from nine to seven. The open-hearth department at Ensley is on a half turn.

The other active blast furnaces in Alabama are one Sloss-Sheffield Steel & Iron Co., and one Alabama Co. All others are down. The total of active stacks in Alabama is nine, compared with 25 and 26 at the high point of operations in 1920. Charcoal iron stacks are idle.

The American Steel & Wire Co.'s wire and nail mill at Fairfield is averaging half time. With the exception of the by-product coke plant all departments at Gadsden of Gulf States Steel Co., are idle.

About one-third of the sanitary pipe shops are in operation on part time. Several of the Gadsden shops are operating but those in Anniston remain idle. Two of the water and gas pipe plants of the United States Cast Iron Pipe & Foundry Co., are operating and two are idle. The plants of the American Cast Iron Pipe Co., and the National Pipe Co., are in operation.

By-product coke production in Alabama during 1920, according to the geological survey was 3,075,000 tons, compared with 2,230,000 tons in 1919, and 2,634,451 tons in 1918.

Austin Bros., manufacturers of structural steel and steel bridges, of Atlanta, have purchased a large site near the plant of the Southern Wood Preserving Co., Atlanta, and will construct a larger plant this year. The property has a frontage of about 1000 feet and contains more than eight acres. No details of the magnitude of the plant have been announced as yet. Officials stated, however, that work on the plant would begin within the next three or four weeks.

Operations at the plant of the Brunswick Marine Construction Co., Brunswick, Ga., have been suspended, following a strike of machinists and boilermakers, who refused to accept a 10 per cent reduction in wages. Earlier in the year, a first reduction of 10 per cent was put in effect. Under the proposed new schedule the rate would be 72 cents per hour.

More than 300 manufacturers attended the meeting of the Georgia Industrial Development association in Macon, March 15, to plan greater development of the state's industrial resources. Among those who addressed the manufacturers were Dr. Raymond F. Bacon, of Pittsburgh, director of the Mellon Institute of Industrial Research, on "Industrial Experiments;" Dr. S. W. Stratton, of Washington, director of the United States bureau of standards; Dr. Arthur D. Little, of Boston, chemical engineer; Floyd C. Furlow, of New York, president of the Otis Elevator Co.

The state-wide industrial tour to be conducted in Georgia during the week of April 4 under the direction of the Georgia School of Technology, Atlanta, is now being organized by Governor Hugh M. Dorsey. Leading manufacturers will make the trip.

Worcester Association Elects Officers

The twentieth annual meeting of the Worcester, Mass., branch of the National Metal Trades association was held March 16, when the following officers were elected for the ensuing year:

President, Albert J. Gifford, Leland-Gifford Co., Worcester; vice president, Frederick Fosdick, Fitchburg Steam Engine Co., Fitchburg, Mass.; treasurer, Arthur W. Beaman, Stockbridge Machine Co., Worcester.

Members of executive board for two years, John C. Spence, Norton Co., Worcester; F. A. Ball, L. S. Starrett Co., Athol, Mass.; J. H. Drury, Union Twist Drill Co., Athol; Harding Allen, Charles G. Allen Co., Barre, Mass.; Frank E. Norcross, Hopedale Mfg. Co., Milford, Mass., and Reginald Washburn, the Wire Goods Co., Worcester.

Members of executive board for one year, F. E. White, Central Oil & Gas Stove Co., Gardner, Mass., and E. P. Maguire, Lapointe Machine Tool Co., Hudson, Mass.; hold-overs for one year, George I. Alden, Norton Co.; Douglas P. Cook, Boston Pressed Metal Co., Worcester; John Bath, John Bath & Co., Inc., Worcester, and L. E. Bellows, Walden-Worcester, Inc., Worcester.

Honorary presidents, George F. Brooks, Charles E. Hildreth, John W. Harrington, Jerome R. George, Edward M. Woodward, Albert E. Newton, John W. Higgins and William H. Gates, all of Worcester.

The annual banquet held the same night at the Bancroft hotel, attended by 175, was addressed by Judge William H. Speer, Jersey City, on "The Arbitrary Domination of Labor by Anyone a National Menace," and Rev. E. Victor Bigelow, Andover, Mass., on the "Mistakes of the Inter-Church Steel Report."

Better Business

Reported by Indianapolis Manufacturers—New Rolling Mill Starts

Special Correspondence

Indianapolis, March 22.—With construction work on the new 6-mill sheet plant of the Chapman-Price Steel Co., Indianapolis, practically completed, the company will resume operations this week, according to announcement by L. H. Price, general sales manager. About 200 men will be employed and the mill will start operations at about one-half of capacity. The company's plant was burned about one year ago. It then sold its old site on Madison avenue and purchased a larger tract at Troy avenue and Shelby street. The new mill has a much larger capacity than the old.

A survey of the industrial situation in Indianapalis, gained from interviews with operating heads of several of the large producing units, shows a decided improvement both in production and in the working forces employed, compared with six weeks ago. Shortly after the turn of the new year some industries were almost at a standstill.

That there has been a material increase in some lines of manufacture is shown by statements of executives of some of the large automobile companies. While no company is operating at full capacity, practically all have experienced a change for the better. Production has increased in fairly good volume within the last few weeks.

The Midwest Engine Co. is increasing its production of motors and of truck and tractor engines. H. W. Griffith, secretary-treasurer, reports that the company within the last two weeks has added considerably to its working force and that production gradually is being increased. The company now is operating more than 60 per cent of capacity and has business booked far into the future.

The same condition as to new business is reported by W. N. Thompson, president of the Stutz Motor Car Co.

"We are running at about 80 per cent of full capacity," Mr. Thompson said, " and have orders booked that will assure operations at the present rate until early in May. We anticipate quite a good business. Compared with the first of the year, business has improved considerably."

George W. Dickson, president and general manager of the National Motor Car & Vehicle Co., also reports a good increase in plant activity. "It looks as if by April 1 production again will be close to normal," he said. "We have been increasing our production right along," said Howard Marmor, of Nordyke & Marmon Co.

Tool Demand Slow To Increase

Sales Are Confined to Single Machines—Large Inquiries Are Out from the General Electric Co. and the American Sugar Refining Co.—Prices Hold Better—Crane Orders Increase in February

SALES and inquiries in the machine tool and equipment market continue small in size though a little more numerous. In the week just past, a number of fair sized inquiries came out. One consisted of a list of 50 tools by the American Sugar Refining Co., New York, and another was a request for prices on a list of 25 tools by the General Electric Co. Aside from these and that of the Batavia Car Works, Batavia, N. Y., inquiries are confined to from one to 10 tools.

In some districts, some improvement is noted in general industrial activity. Automobile manufacturing districts report a noticeable change for the better, but so far this has not been reflected in renewed tool buying. It is understood some projects which have been in process of organization for some time past, will be launched shortly and dealers are looking forward to these as potential sources of new machinery demand.

The railroads, which a week ago were noted as inquiring more actively, still continue in the market. During the week, about $10,000 of tools was purchased by the Chicago, Milwaukee & St. Paul railroad.

Tool prices are steadier and reductions are coming more slowly. Two companies, the Kempsmith Machine Co., Milwaukee, and the Newdoty Machine Co., Janesville, Wis., are the latest builders to announce price reductions. Used machines continue to command much attention from prospective buyers. The auction at the plant of the Bristol Machine Tool Co., Bristol, Conn., was attended by more than 300 manufacturers.

Crane business continues to be confined to a few sales. Inquiries seem to be on the increase and manufacturers of this equipment are looking forward to fair business shortly. Electric traveling crane orders in February exceeded those for January by 13.7 per cent. On the other hand shipments decreased 12 per cent.

Fair Sized Inquiries Enliven Eastern Tool Market

NEW YORK, March 22.—What is regarded as a significant development by some members of the eastern equipment trade is the issuance of a list of 25 machine tools by the General Electric Co., Schenectady, N. Y. At the close of last year, this company had an extensive list before the market, but later withdrew, due, it was said, to the unfavorable outlook of prevailing general business conditions. Consequently, the issuance of the current list, although much smaller than the original, is a matter of considerable satisfaction to sellers, who also see in this a disposition to regard machine tool prices more favorably.

Since the first of the year practically every type of standard machine tool has undergone a substantial decline in price, and, as a matter of fact some trade observers believe that the present downward movement has about reached the end of its dip. In support of this belief, they point to the continued shrinkage of production. However, it is yet to be seen what action the General Electric Co. will take, and while this may be of no special significance, it is, nevertheless, awaited with considerable interest.

The inquiry calls principally for power presses, but includes, among other equipment, shapers, lathes and milling machines. Another list to be issued recently, and the largest now active before the trade, is that of the American Sugar Refining Co., 117 Wall street, involving about 50 metal and wood working machines for its new plant in Baltimore. Miscellaneous inquiry shows a slight improvement, although the market is still relatively dull. Foremost among orders is a list of eight 14-inch Hendee lathes for the Frankford arsenal, Philadelphia. A couple of fabricating machines have been purchased by the Brooklyn navy yard, and also by Corning & Co., Albany, N. Y., the order for the latter being placed with a Canton, O., maker.

Price revisions of the past week include a reduction by the Kempsmith Machine Co., Milwaukee, of 15 per cent on milling machines, and a reduction by the Newdoty Machine Co., Janesville, Wis., of approximately 10 per cent on fabricating equipment, this being the second reduction within the past two months.

Overhead crane buying is confined to a few orders, including a 15-ton crane, with 52-foot span, for John Gillies & Sons, Inc., Long Island city. The business went to the Bedford Foundry & Machine Co., Bedford, Ind. New inquiries are also light and include a 5-ton, 110-volt direct current overhead crane, with 50-foot span, for Jay H. Newbury & Son, Goshen, N. Y. Another inquiry calls for a 10-ton electric overhead crane with 50-foot span, for the Terre Haute Boiler Works Co., Terre Haute, Ind. Revised specifications of the M. W. Kellogg Co., Jersey City, call for a 5-ton, with 100-foot span, a 20-ton with 80-foot span, and two hooks spaced 10 or 12 feet apart, a 30-ton, with 10-ton auxiliary and 80-foot span, and a 40-ton electric overhead crane, with 10-ton auxiliary and 62-foot span. The American Sugar Refininig Co., 117 Wall street, is expected in the market shortly for three 5-ton overhead electric cranes. The Treadwell Construction Co., Midland, Pa., has bought a full revolving portal crane. The Gibney Iron & Steel Co., Phillipsburg, N. J., is inquiring for an electrically operated 20-ton locomotive crane, either new or used. T. H. Henkels Co., 407 Whitman building, Philadelphia, is inquiring for a 35 or 40-ton locomotive crane, suitable for mounting on a coal barge. The American Radiator Co., Buffalo, is in the market for a 20-ton used

Rolling Mill Jim Says Times Are Changing

Say Fellas':

You remember it wasn't but a short time ago when we used to be tellin' the Sales Department what to do and what not to do. Right now we're willin' to take orders from them. And they'll soon be givin' 'em, so you'd better get ready by orderin' your HUBBARD ROLLS.

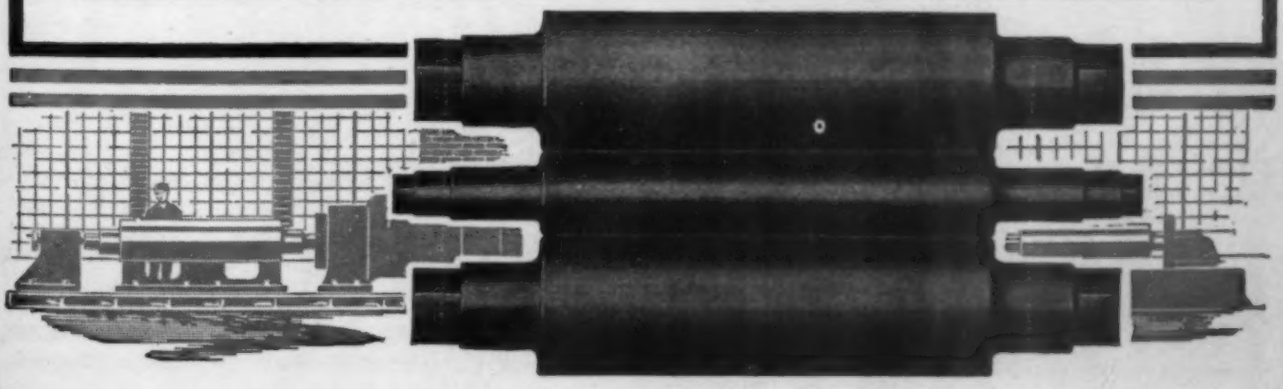
S' Long,

Rolling Mill Jim.

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings



locomotive crane, equipped with 60-foot boom and 1½ cubic yard clam shell bucket, for shipment to Fernandina, Fla. The Tuscarawas County Iron & Metals Co., New Philadelphia, O., is inquiring for a 20-ton locomotive crane equipped with 50-foot boom, generator and electric lifting magnet. J. Goldenberg, Henderson street, Jersey City, N. J., is in the market for a new 20-ton locomotive crane, equipped with 45-foot boom, generator and magnet. The department of wharves, docks and ferries, Bourse building, Philadelphia, has announced that it will not purchase locomotive cranes for operation on its new piers. It is said that it is likely some gantry cranes will be used, however. Morris M. Fineberg & Co., 752 Old South building, Boston, are inquiring for a 25-ton locomotive crane equipped with an electric magnet. The Jamestown Malleable Products Corp., Jamestown, N. Y., recently in the market for a 20-ton locomotive crane equipped with magnet, has temporarily withdrawn. Sampson & Reuter, general contractors, Elizabeth, N. J., have rented a 20-ton locomotive crane with clamshell bucket. The Bartlett Hayward Co., Baltimore, who was also in the market recently for a 20-ton locomotive crane, has temporarily withdrawn.

Orders for replacement purposes comprise the bulk of activity in the eastern foundry equipment market. An increased volume of inquiry is out, due largely to various plans for changing or increasing production, but these plans, for the most part, are still far from being definitely settled upon, and, consequently, are resulting in little actual buying. An encouraging feature has been a slight improvement in the number of new foundry companies, although practically no large organizations have been effected. But here again little increase in demand has as yet resulted, and, on the whole, the market remains dull, with hesitancy still a dominating factor. Export trade is at a standstill.

Little Change is Noted at Boston

BOSTON, March 22.—Actual sales of machine tools during the past week have been few but many dealers report a noticeable increase in inquiry. In Connecticut the increase in activity has been more marked than in the Massachusetts market. Several southern Connecticut dealers report the best week in the matter of inquiry since the first of February. Sales of used tools have been prominent in th transactions and the week has seen several complete plant equipments go under the hammer. One was that of the Bristol Machine Tool Co., Bristol, Conn., and this equipment included nearly 100 tools of standard make. Prices at this sale were erratic and hardly indicative of the market. The general average, however, apparently is somewhat lower than any similar sales earlier in the year. The Savage Arms Corp. on March 17, sold the equipment of its Chicopee, Mass., plant including many standard tools. Several machine tool builders in New England have experienced a slight increase in orders during the past week but most of these have come from outside of this territory. One builder sold seven machines for shipment to points west of the Hudson river. Prices of new equipment still hold firm and at least part of the business involved in recent inquiry is dependent upon price reductions.

Market Stagnation Continues

CHICAGO, March 22.—Little change is noted in demand for machine tool equipment. Salesmen report users have entered a passive state and have settled down to wait until conditions change. Some of them believe this will not take place until September of this year or early next year. An occasional sale is made of a single tool to some small machine shop for replacement or enlargement. Almost without exception, large users are entirely out of the market and cannot be tempted to consider any additions to their equipment. Occasional vague signs of better inquiry are noted, but have not yet developed to a definite stage. Some machinery bought some time ago and held back from delivery has been released but considerable yet remains undelivered. No changs have been made recently in prices, the most recent being reductions in milling machines previously mentioned. Manufacturers of drills and other small machine supplies find their problem complicated by meeting large quantities of their own goods, manufactured during war times and now thrown on to the market at much under present prices. Prices on some lines are so radically below present producers' prices that it is impossible to compete with them.

Industrial Improvement Helps Market

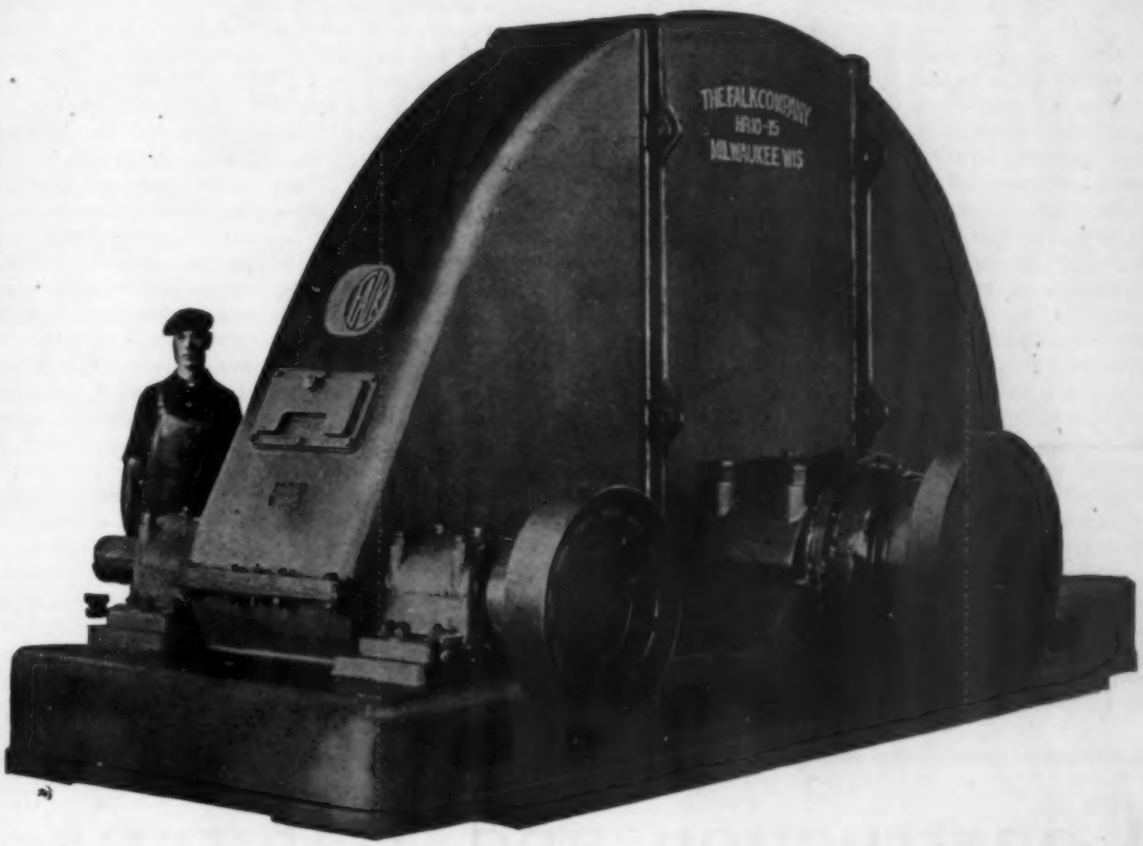
MILWAUKEE, Wis., March 22.—Improvement in such distinct lines o findustry as textiles, shoes and motor vehicles is being reflected by better inquiry from such manufacturers for equipment, which in turn is reflected by interest from manufacturers in machine tools. It appears, however, that the need of new tools is not pressing and in a great many cases the urgent requirements are being met to a major extent by the purchase of used tools. Sales of new tools form a small aggregate. Rarely is more than a single tool purchased and generally the sale is closed on the basis of price concessions, as buyers usually canvass the field of makers and dealers and get them into competition in the effort to get the lowest figure possible. The purchase of about $10,000 worth of tools, including an engine lathe, boring mill and a number of lesser machines, by the Chicago, Milwaukee & St. Paul railway for its repair shops at La Crosse, Wis., was reported during the week. Otherwise the transactions that have come to light are individually negligible, although the period was an active one in respect to inquiry. Industrial construction is at a low ebb and while some metalworking shops are building small additions, the volume of orders is such that existing equipment suffices and new purchases are being made principally for replacement or to piece out equipment. In the automotive parts and accessories industry, the high spot is one Milwaukee plant which is working at 85 per cent of capacity and is meeting a demand which is keeping it two weeks behind on deliveries. This and several other large plants of the same kind have word that requirements after April 1 will become more seasonable and require considerably more capacity than is now being employed in the manufacture of engines and parts of all kinds for passenger vehicles.

Small Improvement Shown In Demand

TORONTO, Ont., March 22.—The demand for machinery and machine tools in the Canadian market has shown very little improvement during the past week. Sales were confined to single machines, but according to inquiries received, it appears some fairly good sized lists will come out soon. Prices remain unchanged although some dealers are resorting to shading when there is a possibility of a sale. Secondhand equipment appears to be in chief demand and some good sales in this class of equipment were made recently. Small tools are quiet and buying is confined chiefly to immediate needs, big lists being absent. The Canadian National railway is continually entering the market for small supplies.

The Royal Brush Co., Hamilton, Ont., wants a secondhand pony planer, 16 or 18 inches, with long bed, also cut off and rip saw. The Temiskaming & Northern Ontario Railway commission, 56 Church street, will spend $57,500 on machinery, tools and equipment; the Ontario School for the Deaf, Belleville, Ont., will purchase equipment for a shoe shop to cost $18,000 and equipment for carpenter shop to cost $2500. The Gove Motor Co., Till-

Herringbone Gears Units



Large steel mills have accorded FALK Herringbone Gears universal recognition for their electric drives, and heavy shaft line drives.

They have found that these gears are absolutely dependable and eliminate all shock, noise and vibration. They reduce upkeep and consumption of power.

Steel Castings

From 1 Pound to 100,000 Pounds

WRITE FOR FALK LITERATURE

The Falk Company, Milwaukee, Wis.

REPRESENTATIVES:

PITTSBURGH—W. O. Beyer, 1007 Park Building
SAN FRANCISCO—F. W. Grimwood, Rialto Building
WILKES-BARRE, PENNA.—Vulcan Iron Works
NEW YORK—M. P. Fillingham, 50 Church Street
DENVER, COLO.—Denver Engineering Works
MONTREAL, QUE., CAN.—Engineering Equipment Co., Ltd., 263 St. James St.

bury, Ont., will purchase metalworking machinery and special equipment; the St. Mary's Milling Co., St. Mary's, Ont., wants machinery for a mill and a number of other companies are in the market for equipment.

Single Sales Rule the Market

PITTSBURGH, March 22.—While buyers of machine tools are not totally abstaining from the market, considerable reluctance to close on equipment continues to be noted. Sales comprise single tools although exceptions are noted from time to time. The National Tube Co., Pittsburgh, closed on a 24-inch lathe and a 54-inch boring mill for its Lorain, O., works. The Carnegie Steel Co. purchased a 36-inch lathe on its small list recently issued, the remainder of which still is held in abeyance. Many of the larger buyers await price concessions and this action appears to be justified for the reason that from time to time additional reductions are announced by machine tool manufacturers. The latest reduction noted is the 15 per cent cut made by the Kearney & Trecker Co., Milwaukee, on milling machines. A coal company in Fairmount, W. Va., is asking for four machines, namely a shaper, miller, small lathe and radial drill. This is the largest inquiry of the week noted. One company wants a drill press and a lathe and another user desires several lathes, but the usual inquiry calls for single machines.

Crane purchasers are holding off believing concessions in price will be made. Most of the current inquiries are for estimating purposes and outside of these crane sellers continue to work on old propositions. It is thought the International Nickel Co., Huntington, W. Va., will close soon on its requirements of six or eight cranes as well as sheet and merchant mills since the contracts for the buildings were let on March 18. One unidentified inquiry calls for a 7½-ton crane and the Hoosier Rolling Mill Co., Terre Haute, Ind., wants two. With the Pawling & Harneschfeger electric traveling cranes recently purchased by the Cambria Steel Co., Johnstown, Pa., for its Semet-Solvay plant, a 10-ton Whiting hand-power crane was bought.

No Improvement Is Noted

CLEVELAND, March 22.—No improvement was noted in the demand for machinery and machine tools in this district during the past week. If anything, the market appears to have been duller than it has for some weeks back. Sales, which have been few are still confined to single machines.

During the week just past, included in buyers in this district was the Cleveland Armature Works, Cleveland, and the American Steel & Wire Co., Cleveland.

Dealers during the past few days have been requested to bid on approximately 163 tools in the plant of the Enterprise Tool Co., Cleveland. This equipment which includes, shapers, planers, millers, etc., is said to be valued at approximately $200,000, but so far as known the highest bid made on it was approximately $150,000. This the company refused to accept.

Little future activity is in prospect. Dealers feel confident there will not be a buying revival until next fall and are satisfied therefore if they are able to close even small orders. Industrial building activity is practically at a standstill. Of interest is the report that an automobile manufacturing company, now located at Lorain, O., is planning to move its plant to Cleveland. Dealers in this district, during the past week have been advised that the Akron-Universal Tire & Rubber Co., Akron, O., is completing a plant and wants equipment.

Orders for overhead electric traveling cranes for February increased 13.7 per cent over those of January this being the second consecutive month to show an upward trend. Despite this, shipments decreased about 12 per cent. Cancellations during the month were the least reported in three months. The total unfilled orders on the books of manufacturers of this equipment, is equivalent to over three months' production at the 1920 rate. Suspended orders in February amounted to only eight per cent of the total of unfilled orders.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

PORTLAND, ME.—Portland Iron Co. has been incorporated for $10,000 by Harris Shimelovich and others of Portland.

BOSTON—McKenney & Waterbury Co., Inc., has been organized for $400,000 to manufactur electrical goods and lighting appliances. The directors are William A. McKenney, Alred J. Paine and M. W. Vye.

BOSTON—The J. Comer Jones Power & Pump Co. has been incorporated to make pumps and machinery, with $20,000 capital stock, by J. Comer Jones and William Edward Fennell, both of Brookline, Mass., and Harry Fennell, Everett, Mass.

CAMBRIDGE, MASS.—Blanchard Instrument Co. has been incorporated for $20,000 to manufacture machinery, tools, etc. The directors are Lester C. Gustin, president; William P. Shine, 109 Hillside avenue, Arlington, treasurer, and B. D. Barker.

FITCHBURG, MASS.—The Wachusett Motor Co. plans a 1-story plant building, 106 x 116 feet.

MIDDLEBORO, MASS.—The plant of the Colonial Brass Co. recently was damaged by fire.

SPRINGFIELD, MASS.—Auto Electric Ignition Co. has been incorporated for $50,000. John G. Waddell, 497 Belmont avenue, Springfield, is one of the incorporators.

WORCESTER, MASS.—Work has been started by Ashworth Bros., Inc., on a 3-story manufacturing building, 67 x 171 feet.

WOONSOCKET, R. I.—The Woonsocket Heddle Co. has been incorporated to make heddles, drop wires and other products, with 500 shares of no par value, by John C. Shambow, Edward L. Singsen and Arthur G. Singsen.

PROVIDENCE, R. I.—The Builders' Iron Foundry has let a contract for a machine shop building.

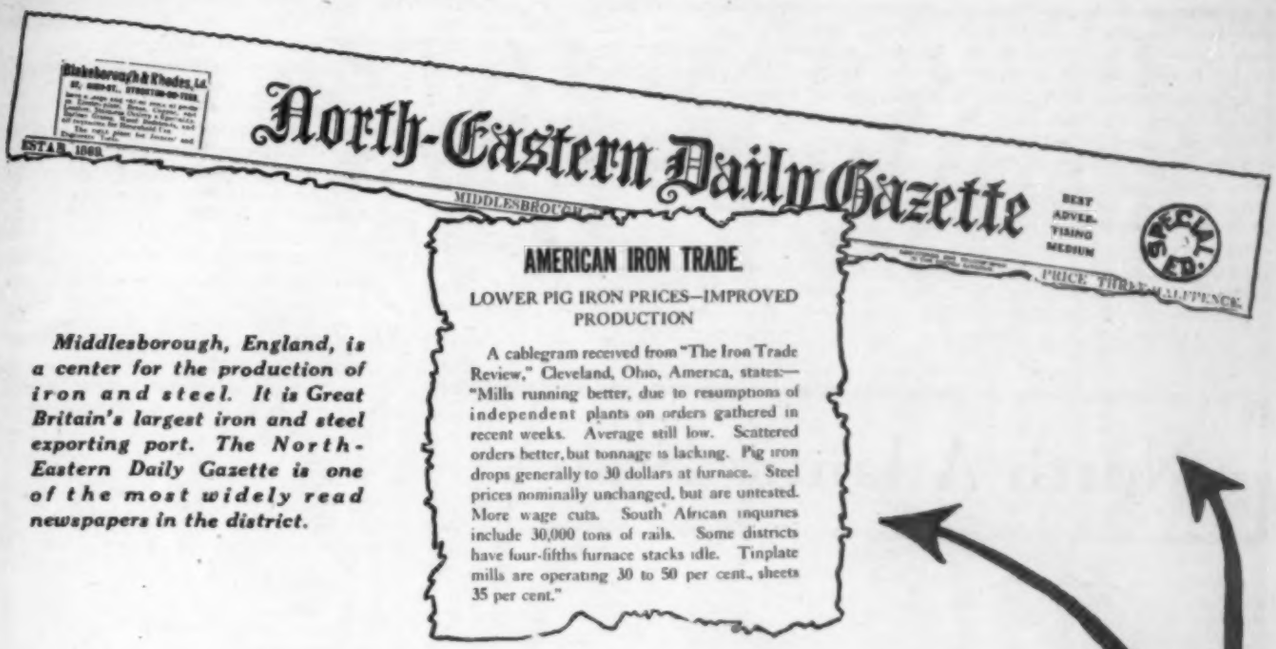
PROVIDENCE, R. I.—The New Era Die Co., 128 North Main street, has been organized to manufacture dies, etc., by W. A. James and others.

BRIDGEPORT, CONN.—The Bridgeport Boiler Works plans a 1-story, 60 x 80-foot warehouse and dock to cost $40,000.

BRIDGEPORT, CONN.—Harry E. Gilbert & Son, Inc., has been incorporated as a machinist with $100,000 capital by H. E. Gilbert, M. Gilbert and H. Lees.

HARTFORD, CONN.—A $50,000 addition will be erected by the Connecticut Blower Co., Inc. Plans call for a structure, one story, 50 x 175 feet.

HARTFORD, CONN.—The Corbit-Craig Equipment Co., Inc., has been incorporated to


Blackborough & Rhodes, Ltd.
North-Eastern Daily Gazette
MIDDLESBROUGH
BEST ADVERTISING MEDIUM
SPECIAL ED.
PRICE THREE HALFPENCE
AMERICAN IRON TRADE.
LOWER PIG IRON PRICES—IMPROVED PRODUCTION
A cablegram received from "The Iron Trade Review," Cleveland, Ohio, America, states:—"Mills running better, due to resumptions of independent plants on orders gathered in recent weeks. Average still low. Scattered orders better, but tonnage is lacking. Pig iron drops generally to 30 dollars at furnace. Steel prices nominally unchanged, but are untested. More wage cuts. South African inquiries include 30,000 tons of rails. Some districts have four-fifths furnace stacks idle. Tinplate mills are operating 30 to 50 per cent., sheets 35 per cent."

Middlesborough, England, is a center for the production of iron and steel. It is Great Britain's largest iron and steel exporting port. The North-Eastern Daily Gazette is one of the most widely read newspapers in the district.

400 Newspapers Regularly Quote

THE IRON TRADE REVIEW

CLEVELAND

The international reputation and the World-wide circulation of THE IRON TRADE REVIEW is the result of year after year of unfailing Editorial accuracy and reliability.

PROOF—

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

make headlight controllers, automobiles, etc., with $50,000 capital by L. H. Corbit, Bridgeport, Conn., R. C. Craig, R. C. Rockwell, G. M. Hanchett and H. J. Cummings.

NEW HAVEN, CONN.—The New Haven Gas & Light Co. plans an office building addition at a cost of $10,000.

NEW HAVEN, CONN.—The New Haven Millwrighting Co. has been incorporated to install machinery with $10,000 capital by A. G. Dion, H. E. Epstein and Joseph Spelnitz.

NEW HAVEN, CONN.—The Pay Toilet Lock Co. has been incorporated to build machines with $10,000 capital by M. F. Sullivan, J. C. McCarthy, R. B. Hall, C. B. Nichols, J. W. Laughlin and J. D. Walters.

NEW HAVEN, CONN.—The Columbia Mfg. Co., Inc., has been incorporated for $50,000 to manufacture knives, etc. H. M. Halper, 902 Chapel street, is one of the incorporators.

NEW HAVEN, CONN.—The United Illuminating Co. has let the contract for a 69 x 88-foot extension of its boiler room. The New England Iron Works will furnish and erect the steel work.

NORWALK, CONN.—The Connecticut Chain Co. has been incorporated to make chains with $50,000 capital by E. C. Hubach, H. J. O'Neil, Christian Swartz and C. C. Swartz.

North Atlantic States

BROOKLYN, N. Y.—The Troeger Products Corp. has been incorporated to make chemicals, with $50,000 capital stock, by E. A., F. S. and J. F. R. Troeger, 643 East Thirty-fourth street.

BROOKLYN, N. Y.—The Flushing Sheet Metal Works has been incorporated with $5000 capital stock, by R. Steiner, F. Steiner, F. Polesuk and A. Laiserin, 1613 Prospect avenue.

BROOKLYN, N. Y.—Kenney & Lakeman cutting and grinding machines, has been incorporated with $5000 capital stock, by W. N. Kenney, A. and C. J. Lakeman, 416 East Eighty-fourth street.

DEPEW, N. Y.—The Magnus Steel Co. plans a 2-story building, 40 x 120 feet at a cost of $40,000.

DUNKIRK, N. Y.—The Vulcano Torch & Mfg. Co., Erie, Pa., has acquired property here for the establishment of a plant.

JAMESTOWN, N. Y.—The Julian Pump & Mfg. Corp. has been organized with $500,000 capital stock and has acquired a plant building in which it will operate.

LONG ISLAND CITY, N. Y.—The Schildwechter Auto Co., 2287 Park avenue, plans a factory building, two stories, 100 x 120 feet.

NEW YORK—The Harris H. Uris Iron Works, Inc., 525 West Twenty-sixth street, plans a 6-story manufacturing building.

NEW YORK—The Maspeth Sand & Gravel Co. has been incorporated with $20,000 capital stock, by D. D. Deutsch, G. Adelman and V. Fernandez, 785 Columbus ave.

NEW YORK—The Hunts Point Iron Works has been incorporated with $10,000 capital stock, by L. Kopelson, G. and E. Lippert, 2555 Third avenue.

NEW YORK—The Arco Mfg. Co. has been incorporated with $25,000 capital stock, by T. Binder, H. Firman and H. Lianoff, 201 Sutter avenue.

NEW YORK—The Bullock Mfg. Co., 408 West Thrteenth street, lighting fixtures, etc., has acquired a 6-story building, which it will use as a plant.

NEW YORK—The United Electric Light & Power Co., 130 East Fifteenth street, plans an electric generating plant, one story, 250 x 369 feet.

NEW YORK—The Modern Iron Works has been incorporated with $5000 capital stock, by S. and L. Sternin and S. Chiaet, 77 East 119th street.

NEW YORK—The Harlem Retinning Co. has been incorporated with $5000 capital stock, by D. Simon, D. Pozi and B. Cohen, 20 Lewis avenue.

NEW YORK—The Auto Heater Corp. has been incorporated with $200,000 capital stock, by E. C. and W. H. Hawley and J. R. Delafield, 17 East Seventy-ninth street.

NEW YORK—Tucker & Finkeisen, wire work, has been incorporated with $20,000 capital stock, by F. B. Hollister, L. N. Fickeisen and F. H. Tucker, 34 Cliff street.

NEW YORK—Brown Spin-Wright has been incorporated with $30,000 capital stock to make textile machinery, by I. W. Goodhue, Alex C. Proudfit and A. W. Fiedler, 120 Broadway.

NEW YORK—The Miller Safety Guard Corp. has been incorporated with $100,000 capital stock, by H. and N. Miller, 29 West Thirtieth street.

NEW YORK—The Homo Chemical Mfg. & Importing Co. has been incorporated with $150,000 capital stock, by G. J. Bidtell, P. Richter and B. Schmidt, 937 East Fifteenth street.

NEW YORK—The Accounting Machine Development Corp. has been incorporated with $100,000 capital stock, by D. Connor, F. J. Parker and J. J. Harris, 430 East Fifty-seventh street.

ROCHESTER, N. Y.—The Seneca Metal Corp. has been incorporated with $30,000 capital stock, by G. Szozehowlak, C. Loescher and G. F. Bierbach.

COLUMBIA, PA.—The Keeley Stove Co. plans a plant addition.

EAST BRADFORD, PA.—William Fowler plans a foundry, 35 x 150 feet.

HARRISBURG, PA.—The Delaware, Lackawanna & Western railroad plans a blacksmith, carpenter and machine shop, one story, 83 x 92 feet, at a cost of $30,000.

PHILADELPHIA—The Reyburn Mfg. Co. has awarded a contract for an engine and boiler room to cost about $22,000.

PHILADELPHIA—The Ludlow Iron Products Co. has been incorporated with $10,000 capital stock, by H. E. Penney, 23 South Sixty-first street, and others.

PHILADELPHIA—The F. A. Havens Co. is taking estimates on a 2-story office and pattern shop building, 28 x 87 feet, for Alfred Box & Co.

PITTSBURGH—The Motor Body Co. has been incorporated with $210,000 capital stock, by A. E. Kholos, 3213 Elsinore square, to manufacture automobile bodies.

PITTSBURGH—The Dreyer Metal Products Co. will shortly file an application for a charter to engage in the manufacture of sheet metal and sheet metal products. Harry J. Nesbit, 421 Frick building, is interested.

PITTSBURGH—The Pittsburgh Metal Bed Co. is being formed here and will soon file an application for a charter to engage in the manufacture of beds, bedsprings, etc. I. L. Giffin, Curry building, is interested.

READING, PA.—The Vertomatic Mfg. Co. has been incorporated with $1,000,000 capital stock, by C. E. Long, A. J. Wagner and W. F. Henkel, to manufacture chucking machines.

RIDGWAY, PA.—The General Refractories Co. has been organized by M. P. Shanley, Ives J. and J. Ellis Harvey, Bellefonte, Pa.

BELLEVILLE, N. J.—The Sanford Electric Corp. has been incorporated with $250,000 capital stock, by J. B. Kellogg, G. C. Sturdy and L. C. Burdett, 71 Rutgers street.

CAMDEN, N. J.—The Aladdin Engine Co. has been incorporated with $15,000 capital stock, by A. T., A. R. and D. M. Kay, 1367 Park boulevard.

CAMDEN, N. J.—The Cutler Auto Radiator Co. has been incorporated with $100,000 capital stock, by Herman Z. Cutler, Henry Cooperson and L. M. Verga.

HACKENSACK, N. J.—The Purity Cup Machine Corp. has been incorporated with $5,000,000 capital by T. Achenbach and others.

JERSEY CITY, N. J.—The Hydro-Electro Pyro Co., electric appliances, has been incorporated with $200,000 capital stock, by Paul Andrea, A. H. Francfort and Angelo Diano.

MONTCLAIR, N. J.—The Norwalk Umbrella Frame Co. has been incorporated with $125,000 capital stock, by A. L. Friedman, J. L. Murphy and M. S. Fialda.

NEWARK, N. J.—Bender & Sons plan a machine shop, one story, 50 x 122 feet, to cost about $18,000.

NEWARK, N. J.—The Universal Spring Mfg. Co., 79 Sunset avenue, has been organized to manufacture springs, etc., by B. V. Heitmuller and others.

NEWARK, N. J.—The New Jersey Lamp & Brass Co. has been incorporated with $100,000 capital stock, by Ralph Cortese and F. D. Masticci, 185 Market street.

NEWARK, N. J.—The Modern Steel Wheel Corp. of New Jersey has been incorporated with $125,000 capital stock by Henry Nauschildt, Edward H. Roberts and Christian Kuyl.

NEWARK, N. J.—The Bretcher Mfg. Co., manufacturer of automobile accessories, has leased the first floor of a building at 29 Congress street, which it will operate in conjunction with its present plant.

NEW BRUNSWICK, N. J.—The New Brunswick Cornice Works plans a factory building, three stories, 25 x 75 feet, to cost about $30,000.

OLD BRIDGE, N. J.—The Enamel Brick & Tile Co. has awarded a contract for a 1-story machine shop and dye storage plant, 50 x 80 feet, to cost about $15,000.

SALEM, N. J.—The Clensol Chemical Co. has been incorporated with $100,000 capital stock, by Isaac Castelli, L. O. Burg and E. E. Cushing.

TRENTON, N. J.—John E. Thropp Sons Co. plans a forge shop at a cost of $25,000.

TRENTON, N. J.—The American Rotex Mfg. Co. has purchased the plant of the

(*Continued on page 866*)

STANDARD SCREW PRODUCTS COMPANY

A COMPLETE PLANT

at your service, for the manufacture of special and standard screw products, bar milled, cold headed. Also heat treated, hardened and ground products.

Have you any troublesome problems in this line to be solved?

Would you like to compare the costs of specialists in this line with your own departmental manufacture? Some interesting things are developed by such comparisons.

STANDARD SCREW PRODUCTS COMPANY

2471-2587 BELLEVUE AVENUE
DETROIT, MICHIGAN

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Pittsburgh	$13.00 to 15.00
Chicago	11.50 to 12.00
Eastern Pennsylvania	12.50 to 13.00
Cleveland	13.00 to 13.25
St. Louis	12.00 to 12.50
Buffalo	11.50 to 12.50
New York (dealers)	9.00 to 9.50
Birmingham	14.50 to 15.50
Cincinnati	10.50 to 11.00
Valleys	13.50 to 14.00
Boston (dealers)	7.50 to 8.00
Detroit	10.00 to 10.50

BUNDLED SHEETS

Pittsburgh	$10.00 to 11.00
Eastern Pennsylvania	9.50 to 10.00
Cleveland	7.00 to 7.50
Buffalo	7.00 to 8.00
Cincinnati	7.50 to 8.00
St. Louis	5.00 to 5.50

STEEL RAILS, SHORT

Chicago	$13.50 to 14.00
Boston (dealers)	12.00 to 13.00
Cleveland	11.00 to 12.00
St. Louis	12.50 to 13.00
Birmingham	14.00 to 15.00
Cincinnati	16.00 to 17.00

STOVE PLATE

Pittsburgh	$15.00 to 16.00
Chicago	16.50 to 17.00
Eastern Pennsylvania	15.50 to 16.00
Cleveland	14.50 to 15.00
Detroit	19.00 to 20.00
Birmingham	17.00 to 18.00
Buffalo	18.00 to 19.00
New York	13.50 to 14.00
St. Louis	14.00 to 14.50
Cincinnati	14.50 to 15.50
Boston (consumers)	14.00 to 14.50

LOW PHOSPHORUS

Pitts., billet and bloom crops	$20.00 to 21.00
Cincinnati	23.00 to 24.00
Buffalo	18.00 to 19.00
Eastern Pennsylvania	18.00 to 20.00

SHOVELING STEEL

Chicago	$11.00 to 11.50
St. Louis	11.50 to 12.00
Pittsburgh	11.00 to 12.00

KNUCKLES, COUPLERS & SPRINGS

Pittsburgh	$14.00 to 15.00
Chicago	12.50 to 13.00
St. Louis	13.00 to 13.50
Eastern Pennsylvania	18.00 to 20.00

COMPRESSED SHEETS

Pittsburgh	$12.00 to 13.00
Chicago	10.50 to 11.00
Buffalo	10.00 to 11.00

FROGS, SWITCHES, GUARDS

Chicago	$11.50 to 12.00
St. Louis	12.00 to 12.50
Eastern Pennsylvania	12.50 to 13.00

BOILER PLATE, CUT

Detroit	$9.50 to 10.50
St. Louis	8.00 to 8.50

ANGLE BARS—STEEL

Chicago	$11.50 to 12.00
St. Louis	13.00 to 13.50

Iron Mill Scrap

RAILROAD WROUGHT

Pittsburgh, No. 1	$16.00 to 17.00
Pittsburgh, No. 2	13.00 to 14.00
Chicago, No. 1	12.25 to 12.75
Chicago, No. 2	11.25 to 11.75
Eastern Pennsylvania, No. 1	17.00 to 18.00
Cleveland, No. 1	13.75 to 14.25
St. Louis, No. 1	12.50 to 13.00
St. Louis, No. 2	12.00 to 12.50
Buffalo	[illegible]
Cincinnati, No. 1	11.50 to 12.50
Birmingham, No. 1	15.00 to 17.00
New York, No. 1 (dealers)	13.50 to 14.00
Boston (dealers)	13.00 to 13.50

WROUGHT PIPE

Eastern Pennsylvania	$14.00 to 15.00
Buffalo	10.50 to 11.50
New York (dealers)	9.50 to 10.00
Boston (dealers)	9.00 to 9.50

YARD WROUGHT

Boston	11.50 to 12.00
Eastern Pennsylvania, No. 1	15.00 to 16.00

CITY WROUGHT

New York, long	$12.50 to 13.00

BUSHELING

Chicago, No. 1	$11.50 to 12.00
Chicago, No. 2	9.50 to 10.00
Cleveland, No. 1	8.50 to 9.00
Cleveland, No. 2	5.50 to 6.00
St. Louis, No. 1	12.00 to 12.50
Buffalo, No. 1	9.50 to 10.50
Cincinnati, No. 1	10.50 to 11.50
Eastern Pennsylvania, No. 1	13.50 to 14.50

MACHINE SHOP TURNINGS

Pittsburgh	$ 9.00 to 10.00
Chicago	6.25 to 6.75
Eastern Pennsylvania	9.50 to 10.00
Cleveland	7.00 to 7.25
Buffalo	8.50 to 9.50
New York (dealers)	5.00 to 6.00
St. Louis	5.00 to 5.50
Detroit	5.00
Cincinnati	4.50 to 5.00
Birmingham	8.00 to 8.50
Valleys	7.00 to 7.50
Boston (dealers)	5.50 to 6.00

CAST IRON BORINGS

Pittsburgh	$11.00 to 12.00
Chicago	7.75 to 8.25
Eastern Pennsylvania	9.50 to 10.00
Eastern Pennsylvania (chem.)	10.00 to 11.00
Cleveland	9.00 to 10.00
St. Louis	8.50 to 9.00
Detroit	7.50
Buffalo	8.50 to 9.00
New York (dealers' price)	6.00 to 7.00
Cincinnati	6.00 to 6.50
Birmingham	8.00 to 8.50
Valleys	11.00 to 12.00
Boston (dealers)	5.50 to 6.00
Boston (Chemical)	6.50 to 7.00

MIXED BORINGS AND TURNINGS

(For blast furnace use)

Eastern Pennsylvania	$ 8.50 to 9.00
Boston (dealers)	4.50 to 5.00
Cleveland	8.00 to 8.50

IRON AXLES

Pittsburgh	$36.00 to 37.00
New York (dealers)	25.00 to 26.00
Chicago	27.00 to 27.50
Eastern Pennsylvania	30.00 to 31.00
Detroit	39.00
Cleveland	23.00 to 25.00
St. Louis	25.00 to 25.50
Buffalo	26.00
Cincinnati	23.00 to 23.50
Birmingham	30.00 to 31.00

IRON RAILS

Chicago	$18.00 to 18.50
Cleveland	15.50 to 16.00
St. Louis	13.50 to 14.00
Buffalo	21.00 to 22.00
Cincinnati	16.00 to 17.00

PIPES AND FLUES

Chicago	$ 9.25 to 9.75
Cleveland	8.00 to 9.00
Detroit	10.50 to 11.25
St. Louis	10.00 to 10.50
Cincinnati	7.50 to 8.00

GRATE BARS

Chicago	$13.00 to 13.50
Cleveland	14.75 to 15.25
Detroit	14.00 to 15.00
Buffalo	11.50 to 12.50
New York (dealers)	13.50 to 14.00
Eastern Pennsylvania	16.00 to 17.00

FORGE FLASHINGS

Cleveland, large	$9.00 to 10.00
Chicago, small	8.50 to 9.00
Cleveland, small	8.00 to 8.50
Boston (dealers)	7.00 to 7.50

FORGE SCRAP

Chicago	$11.25 to 11.75
Eastern Pennsylvania, No. 1	12.00 to 12.50
Boston	7.00 to 7.50

ARCH BARS AND TRANSOMS

Chicago	$18.00 to 18.50
St. Louis	16.00 to 16.50

ANGLE BARS—IRON

Chicago	$18.00 to 18.50
St. Louis	14.00 to 14.50

Iron and Steel Works Scrap

AXLE TURNINGS

Pittsburgh	$12.00 to 13.00
Eastern Pennsylvania	11.00 to 12.00
Boston (dealers)	6.50 to 7.00
St. Louis	6.00 to 6.50
Detroit	10.00 to 10.50
Cleveland	9.00 to 10.00
Buffalo	11.00 to 12.00
Chicago	10.50 to 11.00

STEEL CAR AXLES

Pittsburgh	$18.00 to 19.00
Eastern Pennsylvania	25.00 to 26.00
Cleveland	21.00 to 22.00
St. Louis	17.00 to 17.50
Buffalo	20.00 to 21.00
Chicago	16.25 to 16.75
New York (dealers)	15.00 to 16.00
Birmingham	19.00 to 20.00
Boston (dealers)	17.50 to 18.00
Detroit	20.00

SHAFTING

Eastern Pennsylvania	$25.00 to 26.00
St. Louis	18.00 to 18.50
New York (dealers)	15.00 to 16.00
Chicago	20.00 to 21.00
Boston (dealers)	17.00 to 18.00

Iron Foundry Scrap

CAR WHEELS

Pittsburgh, iron	$20.00 to 21.00
Pittsburgh, steel	14.00 to 15.00
Chicago, iron	14.50 to 15.00
Eastern Pennsylvania, iron	22.00 to 22.50
Cleveland, iron	35.00 to 36.50
St. Louis, iron	14.00 to 14.50
Buffalo, iron	18.00 to 19.00
Birmingham, iron	19.00 to 20.00
Birmingham, tram car	18.50 to 19.50
Boston (consumers)	23.00 to 24.00
Cincinnati	13.00 to 14.00
New York, iron	17.00 to 18.00
Detroit	25.75 to 26.75

NO. 1 CAST SCRAP

Pittsburgh, cupola	$21.00 to 22.00
Chicago, cupola	16.50 to 17.00
Eastern Pennsylvania, cupola	20.00 to 21.00
Cleveland, cupola	18.50 to 19.00
New York cupola (dealers)	16.00 to 16.50
Cincinnati, No. 1, machinery, cupola, (net)	13.50 to 14.50
Detroit	18.00
Birmingham, cupola	18.00 to 20.00
St. Louis, railroad	15.00 to 15.50
St. Louis, agricultural	15.00 to 15.50
Buffalo	18.50 to 19.50
Boston (consumers)	22.50 to 23.50
Valleys	18.00 to 19.00

HEAVY CAST

New York (dealers)	$15.50 to 16.50
Buffalo	19.00 to 20.00
Pittsburgh	13.00 to 16.00
Cleveland	13.00 to 13.50
Boston (consumers)	18.00 to 19.00

MALLEABLE

Pittsburgh, railroad	$15.00 to 16.00
Pittsburgh, agricultural	13.00 to 14.00
Chicago, railroad	14.50 to 15.00
Chicago, agricultural	14.50 to 15.00
Eastern Pennsylvania, railroad	16.00 to 17.00
Cleveland, railroad	15.00 to 16.00
Cleveland, agricultural	12.00 to 12.50
St. Louis, railroad	11.00 to 11.50
St. Louis, agricultural	12.00 to 12.50
Cincinnati, railroad	9.50 to 11.00
Cincinnati, agricultural	10.00 to 11.00
Boston, railroad	15.00 to 16.00
Buffalo	12.50 to 13.50
Detroit	11.00 to 12.00

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Pittsburgh district	$16.00 to 17.00
Chicago	12.50 to 13.00
Eastern Pennsylvania	16.50 to 17.50
Cleveland	15.50 to 16.00
St. Louis	12.75 to 13.25
Birmingham	15.00 to 16.00
Boston (dealers)	12.50 to 13.00
New York (dealers)	14.00 to 15.00

LOCOMOTIVE TIRES

Chicago	$11.50 to 12.00
St. Louis	10.00 to 10.50

LOW PHOSPHORUS PUNCHINGS

Chicago	$14.00 to 14.50
Eastern Pennsylvania	16.00 to 17.00
Pittsburgh	17.00 to 18.00

When the Scrap Market Is Dull

While seeking a more favorable market the best form in which to hold your sheet scrap, etc., and the form that always commands the best prices is the dense hydraulically compressed bundle.

Thus less storage space is required—under roof to prevent loss from corrosion; and because of greater car tonnage under minimum car rate, you add from 25% to 50% freight savings to your profits.

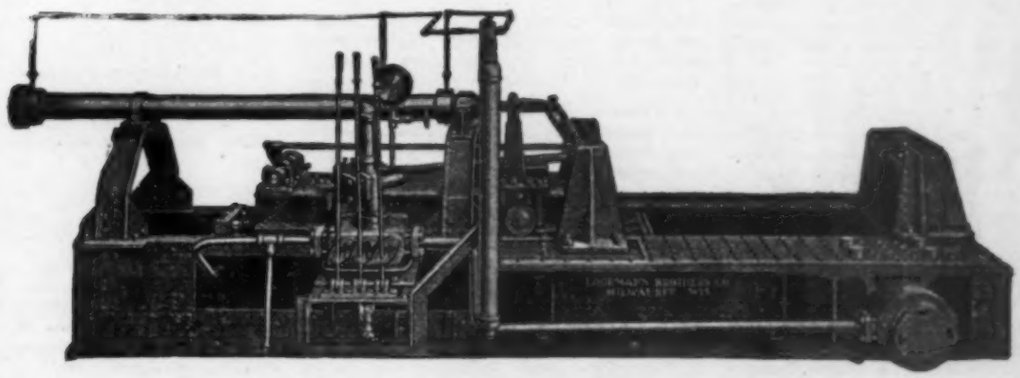
For greatest compression, largest daily output, at lowest operating cost, use

LOGEMANN Double Ram Hydraulic Scrap Metal PRESSES

You can enjoy the advantage of the accumulated experience from hundreds of Logemann scrap bundling presses now in use.

They embody a simplified mechanism that requires no special skill to operate rapidly. Press and pump are so designed that all the motive power applied is utilized, thus reducing power cost.

Powerfully built, all working parts constructed to resist the severest strains—selected material, first class workmanship—all minimize upkeep cost and insure lasting efficiency.



A medium sized press is shown; there are smaller and larger sizes in standard models.

Advise character and daily tonnage of your scrap and let us suggest press best suited to your requirements.

Logemann Brothers Co.

3126 Burleigh Street
Milwaukee, Wis.

Builders of Baling Presses and Hydraulic Machinery

(*Continued from page 862*)

Trenton Lamp, Brass & Copper Works, and will erect additions.

TRENTON, N. J.—The Trenton Flint & Spar Co., Marion street, has awarded a contract for a 2-story plant, 3 x 190 feet, with 30 x 50-foot wing, to cost about $5,000.

BALTIMORE—The Marbo Metal Products Corp. has been incorporated by Francis H. Stevenson, 449 Leader building, Cleveland; J. A. Curtis, W. H. Hill and others.

BALTIMORE—The Lane-Galloway Conveyor Co. has been incorporated with $100,000 capital stock, by Harry A. Lane, P. G. Lane and Charles W. Galloway.

HAGERSTOWN, MD.—The International Mfg. Co., implements, has been incorporated with $200,000 capital stock, by J. K. Hoffman, W. Murray and Charles W. Baechtel.

COLEMAN FALLS, VA.—The Bedford Pulp & Paper Co., Richmond, Va., plans an additional power unit.

Central States Activity

BEAVER DAM, WIS.—The Bell Mfg. Co. plans a factory addition, one story, 40 x 80 feet, to cost about $10,000.

GREEN BAY, WIS.—The H. J. Selmer Co. has the general contract to build a 1-story forge shop and storage building, 85 x 105 feet, for the Green Bay Drive Calk Co. It will cost about $30,000.

GREEN BAY, WIS.—The Standard Oil Co., headquarters, Trust Co. building, Milwaukee, will build a new warehouse, garage, etc., 60 x 120 feet, of brick and steel, in Green Bay to house its local branch. Additional tank storage also will be provided. B. M. Burt is district manager.

KENOSHA, WIS.—Ground has been broken by the Whitcomb Foundry & Machine Co. for a 2-story machine shop addition, 30 x 100 feet.

KENOSHA, WIS.—A 1-story machine shop addition, 30 x 96 feet, will be erected by the Whitcomb Tool & Machine Co., at a cost of about $18,000, including some new equipment now being placed.

LA CROSSE, WIS.—The board of education has accepted the bid of F. R. Schwalbe & Sons to build the new junior high and vocational institute. The building with equipment will cost about $225,000.

MANITOWOC, WIS.—Arthur H. Zander, city clerk, closed bids March 19 for remodeling the old plant of the Manitowoc Electric Light Co. and installing new equipment to convert it into a municipal garbage incinerator. The work will cost about $25,000.

MARINETTE, WIS.—Bids are being taken until April 1 by the board of education for a 2-story junior high school, 66 x 210 feet, and a separate machine shop, one story, 86 x 100 feet. The cost is estimated at $275,000, not including boiler, power plant and shop equipment.

MILWAUKEE—The A. E. Martin Foundry & Machine Co. has a permit to build a 2-story addition, 30 x 36 feet. It will cost about $15,000.

MILWAUKEE—A permit has been granted to the National Steel Foundries, division of the National Brake & Electric Co., to remodel its laboratory building at a cost of about $10,000.

MILWAUKEE—Articles of incorporation have been filed by the Felins Tying Machine Co., organized with a capital stock of $50,000 to manufacture special machinery designed by Fred E. Lins, 1202 Burleigh street.

MILWAUKEE—The A. C. Holtz Chemical Co. has been incorporated with a capital stock of $600,000 by A. C. Holtz and Leo Brielmaier, and will build a plant in North Milwaukee to manufacture a line of chemical products.

MILWAUKEE—Articles of incorporation have been filed by the North Side Brass Foundry Co. which is organized with $25,000 capital stock to manufacture brass, bronze and aluminum castings. The incorporators are A. Urbanek, W. C. Raasch and L. Palck.

RANDOLPH, WIS.—A new factory, 100 x 120 feet, one story, costing about $50,000, will be erected by the Randolph Wagon Works.

SHEBOYGAN, WIS.—Bids are being taken until April 4, at 2 p. m., by the board of education, for a $350,000 high and vocational training school.

TWO RIVERS, WIS.—The Ludolf M. Hansen Construction Co., Green Bay, Wis., has been awarded the general contract for construction of the new Two Rivers high and vocational training school and a separate boiler house and power plant.

DETROIT—The Detroit Motor Bus Co. plans a garage and machine shop, one story.

DETROIT—The Shailer-Conlon Co. has been organized by James L. Conlon and Frank E. Shailer, 6128 Trumbull avenue, to manufacture tools, dies, etc.

DETROIT—The Cutter Grinding Works has been incorporated with $25,000 capital stock, by Mark E. Landsberger, Frank J. Koch and O. N. Naylor, 885 Euclid avenue.

DETROIT—The Harry S. Graves Co. has been organized by Harry S. Graves, 121 Farrand Park, and others, to manufacture mechanical equipment and operate a general machine works.

UNION CITY, MICH.—This city has voted to erect a plant at an estimated cost of $150,000.

WELLS, MICH.—The plant of the Delta Chemical Co. recently was damaged by fire.

CHICAGO—The Melicke Calculator Co. plans a factory and office building.

CHICAGO—The South End Supply Co. has a permit to erect a warehouse, one story, 25 x 40 feet, at a cost of $4000.

CHICAGO—The David J. Molloy Co., 633 Plymouth street, plans a 2-story plant building, 100 x 120 feet, to cost about $100,000.

CHICAGO—Anthony J. Kallacheuer, 3608 Fullerton avenue, plans a 2-story machine shop and garage to cost about $20,000.

CHICAGO—The Wittenmeier Machine Co., 850 North Spaulding avenue, plans a machine shop addition, one story, 28 x 113 feet.

CHICAGO—The Security Tool Works, 115 South Clinton street, has leased a plant building containing 13,000 square feet of floor space.

CHICAGO—The West Chemical Co., 313 South Clinton street, has been incorporated with $30,000 capital stock, by A. E. Rosenfeld, A. Jacobson, A. M. Gordon and others.

CHICAGO—The American Lighting & Mfg. Co., 800 Hibley street, has been incorporated with $100,000 capital stock, by F. E. Davis, W. O. Turtle, W. J. Davis and others.

CHICAGO—Whitney & Ford, 4325 Cottage Grove avenue, plans a 1-story machine shop, and a general service building to be two stories, 30 x 300 feet.

CHICAGO—The Victory Mfg. Co., 2617 Diversey avenue, has been incorporated with $40,000 capital stock, by A. Austin Hinkley, Arthur M. Stenberg and Victro H. Wenzl.

CHICAGO—The Anderson Brake Appliance Co., room 914, 140 South Dearborn street, has been incorporated with $1000 capital stock, by William F. Wauch, Ebon Carl Tourje and others.

CHICAGO—The Cowles Marine Salvage & Mfg. Co., 532 South Green street, has been incorporated with $250,000 capital stock, by John T. Cowles, M. E. Harwich, James D. Davidson and others.

CHICAGO—The Supporter Motometer Lock Co., 1469 South Michigan avenue, has been incorporated with $50,000 capital stock, to manufacture and deal in automobile appliances, by John O. Guthrie, John J. Murphy and C. O. Reynolds.

CHICAGO—The Rapid Changer Corp., 818 Belleforte avenue, Oak Park, has been incorporated with $100,000 capital stock, by M. E. Vasey, E. G. Trench and Walter G. King, to manufacture tabulating and mechanical devices.

CHICAGO—The Ideal Vulco Roll Co., 215 West Superior street, has been incorporated with $50,000 capital stock, to manufacture and deal in printing press rollers, etc., by Oscar Linder, C. K. Knickerbocker, Walter Schutler and others.

CHICAGO HEIGHTS, ILL.—The Railway Steel Spring Co. plans a plant addition, one story, 70 x 160 feet, to cost about $60,000.

CHICAGO HEIGHTS, ILL.—The Durand Steel Locker Co. plans a factory building addition, one story.

EAST ST. LOUIS, ILL.—The Eagle Picher Lead Co. plans alterations to its boiler room.

QUINCY, ILL.—The Michleman Steel Construction Co. plans a plant addition, two stories, 100 x 140 feet, to cost about $500,000.

WINNETKA, ILL.—The Steam Pressing Iron Co. has been incorporated with $210,000 capital stock, by Lawrence M. Stein, A. Greenspahn and A. L. Rittenberg, to manufacture pressing machinery, etc.

EVANSVILLE, IND.—The Hercules Gas Engine Works plans to improve its foundry.

FAIRMONT, IND.—The F. A. Goodness Patent Pin Co. has been incorporated with $30,000 capital stock, by F. A. Goodness, Claude Jones and E. M. Laffler.

FT. WAYNE, IND.—The Daddy Vaporizer Co. has been incorporated with $20,000 capital stock to manufacture vaporizers, etc.

KOKOMO, IND.—The Kokomo Steel & Wire Co. has had plans drawn for a mill building.

KOKOMO, IND.—The Worth Wire Works plans a 1-story addition, 66 x 100 feet, to cost about $12,000.

LIGONIER, IND.—The Highway Construction Co., has been organized to manufacture contractors' supplies and to construct

steel buildings and bridges, by Ward Hill, Hubert Loesser and C. V. Joseph.

LOGANSPORT, IND.—The Redinger-Ball-Morris Mfg. Co. has been incorporated with $25,000 capital stock, to manufacture machinery, by I. R. Redinger, Will Ball and M. W. Morris.

MICHIGAN CITY, IND.—The Weil McLean Co. plans a pattern shop, one-story, 60 x 160 feet, to cost about $50,000.

MUNCIE, IND.—The Muncie Gear Co. plans a factory building to cost about $50,000.

AKRON, O.—The S. & S. Rubber Co. has been incorporated with $10,000 capital stock, by W. J. Schwalb, L. Schwalb, B. Epstein and L. Schwartenberg.

BELLAIRE, O.—The Bellaire Chemical Co. has been incorporated with $35,000 capital stock, by J. S. Dubois, H. W. Shramm, F. C. Bomer, L. L. Cunningham and W. B. Starkey.

BOWLING GREEN, O.—The Anderson Piston Co. has been incorporated with $500,000 capital stock, by C. S. Hatfield, C. C. Anderson, H. H. Elwood, K. J. Branigy and H. M. Kershmer.

CANTON, O.—The Ohio Aluminum & Bronze Foundry Co. has been incorporated with $50,000 capital stock, by S. J. Deutsch, I. J. Rotschild and C. Rosenblatt.

CANTON, O.—The Pyramid Truck Co. has been incorporated with $100,000 capital stock, by E. W. Markling, H. F. Shea, J. A. Skaggs, J. C. Harmony and E. W. Shea.

CINCINNATI—The Concrete Steel Co., New York, plans the construction of a large assembling plant here.

CINCINNATI—The F. H. Bickford Co., tool designer, has increased its capitalization from $10,000 to $75,000, and is reported planning to establish a machine shop to manufacture screw machine products, etc.

CLEVELAND—The Ohio Stanchion Co. has been incorporated with $10,000 capital stock, by A. Sheffel, J. B. Mannis and others.

CLEVELAND—The Sabin Machine Co., 6526 Carnegie avenue, plans a 2-story plant addition, 50 x 80 feet.

CLEVELAND—The Industrial Iron Works plans plant buildings, two stories, 100 x 280 feet, and one story, 60 x 280 feet

CLEVELAND—The Taft Metal Pattern & Mfg. Co. has been incorporated with $10,000 capital stock, by F. W. Taft, W. A. Glunts and others.

CLEVELAND—The Sterling Brass Co. has had plans prepared for a brass foundry and machine shop, two stories, 75 x 90 feet, to cost about $100,000.

CLEVELAND—The B. & G. Machine Co. has been incorporated with $10,000 capital stock, by P. H. Kingsley, H. E. Gilpin Jr., and others.

CLEVELAND—The ground and buildings of the Miroscope Co. and the Baling Tie Buckle Co. have been purchased by the United Stamping & Machine Co.

CLEVELAND—The Lake Erie Rubber Products Co. has been incorporated with $50,000 capital stock, by L. C. Spieth, J. P Taggart, H. A. Heckett, B. Willett and L. M. Henders.

COLUMBIANA, O.—The United States Standard Mfg. Co. has been organized to manufacture cement block machines, by E. H. Grove, L. L. Corbin, H. W. Hammond and others.

DAYTON, O.—The M. & A. Brass Foundry Co. has been organized by Logan Moser and others.

DAYTON, O.—The Duro Pump & Mfg. Co. has been incorporated with $125,000 capital stock, by C. E. Burnett, C. A. Kuebler, R. S. Souey, H. J. Hunt and R. K. Landis.

DAYTON, O.—The Leland Electric Co. has been incorporated with $10,000 capital stock, by G. H. Leland, M. B. Watson and others.

DAYTON, O.—The Expanding Gage Co. has been incorporated with $500 capital stock, by W. E. Koople, M. C. Whitemore and others.

DAWSON SPRINGS, KY.—The federal government plans a power house here.

DELPHOS, O.—The plant of the Delphos Welding Co. recently was damaged by fire.

FINDLAY, O.—The new plant of the Differential Car Co., now under construction, is expected to be ready for occupation by May 1.

FREEPORT, O.—The Crab Orchard Mining Co. plans a power plant, one story, 42 x 44 feet

FREMONT, O.—The Willys Light Home Equipment Co. has been incorporated with $10,000 capital stock, by J. L. Patterson, M. G. Throves, A. J. Vickery and others.

LIMA, O.—The Buckeye Casting Co. plans two plant buildings to cost $75,000.

LIMA, O.—The Pepple Pattern & Mfg. Co. has been incorporated with $50,000 capital stock, by Ross Pepple, Allen Patterson and others.

NORTH JACKSON, O.—The North Jackson Light, Heat, Power & Water Co. has been incorporated with $10,000 capital stock, by G. L. McMillin, B. W. Shrader, D. Kimmel, N. Shipley, A. F. Jones and S. T. Stewart.

TOLEDO, O.—The Motor Macutivator Co. has been incorporated with $60,000 capital stock, by A. B. Richardson, A. G. Ruihley, A. T. Goorley, H. G. Wall and B. Z. Kaplan.

WOOSTER, O.—The Stellar Refinery Co. plans a refinery, boiler house and pump house.

Throughout the West

NEVADA, IOWA—The Mason City Brick & Tile Co., Mason City, Iowa, plans a plant building.

JOPLIN, MO.—The Joplin Steel & Malleable Co. plans a plant addition at a cost of $8000.

JOPLIN, MO.—The P. A. Martin Machinery Co. will erect a plant building, 100 x 140 feet.

JOPLIN, MO.—The Joplin Armature Works, West Fourth street, has been organized by F. E. Belden, D. R. Jarrett and others.

KANSAS CITY, MO.—The Stafford Motor Co. plans a machine shop, one and two stories, 65 x 130 feet, to cost about $27,000.

KANSAS CITY, MO.—The Western Tablet Co. plans a boiler room and fuel storage building, one story, 40 x 100 feet, to cost about $35,000.

KANSAS CITY, MO.—The Kansas City Spiral Pipe Co. has been incorporated with $1,000,000 capital stock, by T. L. Croteau, M. A. Bruce and S. E. Dill, of Wilmington, Del.

SPRINGFIELD, MO.—Harry Schmock will erect a foundry building, 50 x 50 feet.

SPRINGFIELD, MO.—The Stewart Self-Feeder Co. will move its plant from Kansas City to this city, where it has obtained a 2-acre site.

ST. LOUIS—The Modern Machine & Tool Works, 508 Washington street, plans a machine shop, one story, 40 x 100 feet.

ST. LOUIS—The Waycleanse Co., street cleaners, plans a plant for the manufacture of cleaners at a cost of $300,000.

ST. LOUIS—The Hafner Mfg. Co. has leased to the David J. Joseph Co., Cincinnati, practically 100,000 square feet for the assembly and distribution of iron and steel products.

WARRENSBURG, MO.—This city contemplates a municipal light plant.

STAMPS, ARK.—The blacksmith department, boiler room and car repair shop at the Arkansas & Louisiana railroad shops recently were damaged by fire.

CUSHING, OKLA.—The Noel Mfg. Co., 119 East Charry street, has been incorporated with $25,000 capital stock to operate a machine shop, by J. C. Noel, W. T. Walker, Charles E. Droege and others.

DUNCAN, OKLA.—The Lawton Refining Co. will establish a plant here according to a report.

DUNCAN, OKLA.—John Hoffman, Ardmore, Okla., is reported planning to establish a plant here for the manufacture of boilers and other equipment.

ENID, OKLA.—The University Battery & Electric Co. has been incorporated with $100,000 capital stock.

HENRYETTA, OKLA.—Warring & Co. will equip a machine shop, 40 x 150 feet, and are reported in the market for machinery.

AUSTIN, TEX.—Frank S. Taylor, Austin, and G. M. Jowers, San Antonia, engineers, are making a survey for a dam and irrigation system which are to be built by former Governor W. P. Hobby and associates at a cost of $7,000,000. The dam will be located on the Devil's river and will be 210 feet high.

BRYAN, TEX.—The Automatic Electric Shoe Polishing Machine Co. has been incorporated with $75,000 capital stock, by J. L. Edge, J. T. Maloney and C. A. Harris.

DALLAS, TEX.—This city plans an incinerator plant at a cost of $200,000.

ELECTRA, TEX.—The Gladiolus Oil Co. plans to rebuild its power plant, which was recently damaged.

HOUSTON, TEX.—The Texas Supply Co. plans a machine shop and warehouse.

HOUSTON, TEX.—B. H. Elliott, Inc., ship repairs, has been incorporated with $20,000 capital stock, by Don Hall, B. H. Elliott and W. P. Bulkley.

PLAINVIEW, TEX.—Whitesides & Son have purchased a site here on which they plan an iron working shop and foundry.

SPUR, TEX.—The Spur Electric & Power Co. plans a power house, 30 x 50 feet, to cost about $25,000.

LOS ANGELES—The Alloy Steel & Metals Co. is reported planning to issue additional stock to finance a new plant building.

LONG BEACH, CAL.—The Pioneer Metal Products Co. has been incorporated with $100,000 capital stock.

LOS ANGELES—The Great News Heating & Appliance Co. has been incorporated with $250,000 capital stock.

Iron and Steel Prices

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 per cent iron	$7.45
Mesabi Bessemer, 55 per cent iron	7.20
Old range nonbessemer, 51½ per cent iron	6.70
Mesabi nonbessemer, 51½ per cent iron	6.55

Port Henry Iron Ore, f.o.b. Port Henry

Old bed 21 furnace	$5.80
Old bed concentrates, 63 per cent	6.70
Harmony, cobbed, 63 per cent	6.70
New bed, low phos., 65 per cent	9.50
Lump ore for fix	7.00

Manganese Ore

Brazilian, 48 to 50 per cent c.i.f. Atlantic ports, 30 cents per unit, nominal.

Indian 46 to 50 per cent c.i.f. Atlantic ports, 30 cents per unit, nominal.

Fluor Spar

Washed gravel Kentucky and Illinois mines, per ton $20.00 to 22.50

Warehouse Prices

STEEL BARS

Boston	3.63c
Chicago	3.48c
Cleveland	3.30c to 3.34c
Detroit	3.43c
Philadelphia	3.45c
New York	3.58c to 3.63c
St. Louis	3.575c
Cincinnati	3.58c
St. Paul	3.76c
Buffalo	3.50c
San Francisco	4.75c
Seattle	4.25c

IRON BARS

Boston	3.65c
Buffalo	4.20c
Chicago	3.48c
Detroit	3.43c
St. Louis	3.575c
Cincinnati	3.58c
Philadelphia	3.45c
New York	3.58c to 3.63c

SHAPES

Chicago	3.58c
Detroit	3.53c
Boston	3.60c to 3.73c
St. Louis	3.675c
St. Paul	3.86c
New York	3.68c to 3.73c
Cleveland	3.40c to 3.44c
Philadelphia	3.55c
Buffalo	3.60c
Cincinnati	3.68c
San Francisco	4.85c
Seattle	4.25c

PLATES

Buffalo	3.80c
Chicago	3.78c
Detroit	3.73c
Boston	3.93c
St. Louis	3.875c
St. Paul	4.06c
New York	3.88c to 3.93c
Cleveland	3.60c to 3.64c
Philadelphia	3.75c
Cincinnati	3.60c
San Francisco	5.40c
Seattle	5.00c

NO. 10 BLUE ANNEALED SHEETS

New York	4.78c to 4.83c
Philadelphia	4.65c
Chicago	4.68c
Cleveland	4.80c
Boston	5.05c to 5.20c
Buffalo	4.60c
Detroit	4.63c
St. Louis	4.775c
Cincinnati	4.78c
St. Paul	4.96c
San Francisco	6.50c
Seattle	6.35c

NO. 28 BLACK SHEETS

Chicago	5.73c
New York	5.88c
Philadelphia	5.50c
Cleveland	5.00c
Boston	6.05c
Cincinnati	5.68c
Detroit	5.60c
St. Louis	5.85c
St. Paul	6.00c
Buffalo	5.65c
San Francisco	7.25c
Seattle	6.95c

NO. 28 GALVANIZED SHEETS

Chicago	7.10c
New York	6.50c to 7.13c
Philadelphia	6.25c
Boston	6.95c
Cleveland	6.00c
Cincinnati	6.78c
Detroit	6.95c
Buffalo	7.00c
St. Louis	7.20c
San Francisco	8.75c
Seattle	8.15c

Freight Rates

PIG IRON

Mahoning and Shenango valleys to:

Cleveland	$1.96
Newark, N. J.	6.72
Boston	7.28
Philadelphia	6.32
Pittsburgh	1.96
Chicago	5.32
St. Louis	6.44
Minneapolis, St. Paul	7.60

Buffalo to:

Albany, N. Y.	$2.52
New England (rail)	5.46
New York and Brooklyn (rail)	5.46

Virginia furnaces to:

Philadelphia	$5.74
New England	6.58
Brooklyn, Jersey City, Newark	6.16

Birmingham, Ala., to:

Boston	$10.665
Boston (rail and water)	7.65
Cincinnati	4.50
Chicago	6.66
Cleveland	6.66
Louisville, Ky.	4.12
Minneapolis, St. Paul	9.73
New York	10.26
Philadelphia	8.665
Pittsburgh	7.60
Savannah, Ga.	4.25
St. Louis	5.725

Chicago to:

Des Moines	$4.725
Minneapolis, St. Paul	3.375
Milwaukee	0.89
Moline, Ill.	1.89
Omaha	6.07
St. Louis	2.725

Ironton and Jackson, O., to:

Chicago	$5.32
Cincinnati	2.52
Cleveland	3.36
Detroit	3.64
Indianapolis	3.22
Minneapolis, St. Paul	8.40

FINISHED MATERIAL

Pittsburgh, carloads, per 100 lbs., to:

New York	$0.38
Philadelphia	0.35
Boston	0.415
Buffalo	0.295
Baltimore	0.335
Cleveland	0.24
Cincinnati	0.32
Chicago	0.38
Detroit	0.32
Minneapolis and St. Paul	0.66
Denver	1.32
St. Louis	0.475
New Orleans	0.515
Birmingham	0.765
Pacific coast (all rail)	1.665
Pacific coast (tin plate)	1.665

BANDS

New York	4.28c to 4.33c
Boston	4.33c
Detroit	4.13c
Buffalo	5.30c
San Francisco	5.45c
Seattle	4.95c

HOOPS

Buffalo	4.20c
Boston	5.00c
New York	4.58c
Detroit	4.13c

COLD ROLLED SHAFTING

Buffalo	5.15c
New York	5.50c to 5.65c
Boston	5.25c
San Francisco	6.75c
Seattle	6.75c
New York	6.00c to 6.15c
Detroit	5.00c

Steel Pipe

Pittsburgh basing discounts, jobbers, carloads

STANDARD WEIGHT

Butt Weld

	Black	Galvanized
⅛, ¼ and ⅜-inch	50½	24
½-inch	54½	40
¾ to 3-inch	57½	44

Lap Weld

2-inch	50½	38
2½ to 6-inch	53½	41
7 to 12-inch	50½	37
13 to 14-inch	41	
15-inch	38½	

PLUGGED AND REAMED

Butt Weld

1 to 3-inch	55½	42

Lap Weld

2-inch	48½	36
2½ to 6-inch	51½	39

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼ and ⅜-inch	46½	29
½-inch	51½	39
¾ to 1½-inch	55½	43
2 to 3-inch	56½	44

Lap Weld

2-inch	48½	37
2½ to 4-inch	51½	40
4½ to 6-inch	50½	39
7 to 8-inch	46½	33
9 to 12-inch	41½	28

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld

½-inch	42½	32
¾ to 1½-inch	45½	35
2 to 2½-inch	47½	37

Lap Weld

2-inch	40½	31
2½ to 4-inch	42½	33
4½ to 6-inch	41½	32
7 to 8-inch	36½	23

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS

Butt Weld

	Black	Galvanized
⅛-inch	+	+ ....
¼-inch	+ 5½	+31½
⅜-inch	15½	+11½
½-inch	24½	6½
¾ to 1½-inch	29½	13½

Lap Weld

1¼ and 1½-inch	+	+ ....
2 and 2½-inch	25½	11½
3 to 6-inch	27½	14½
7 to 12-inch	24½	11½

PLUGGED AND REAMED

Two points less than above

Butt Weld

⅛-inch	+	+ ....
¼-inch	+13½	+46½
⅜-inch	13½	+ 3½
½-inch	23½	10½
¾ to 1½-inch	29½	14½

Lap Weld

1¼ to 1½-inch	+	+ ....
2 and 2½-inch	26½	13½
3 to 4-inch	28½	16½
4½ to 6-inch	27½	15½
7 to 8-inch	19½	7½
9 to 12-inch	14½	2½

+Price on application.

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld

½-inch	+37	+49
¾-inch	+17½	+29½
1-inch	+33½	+45½
1¼-inch	+17½	+29½
1½-inch	+16½	+28½

Lap Weld

2 and 2½-inch	+ 2½	+14½
3 to 4-inch	2½	+ 6½
4½ to 6-inch	1½	+ 7½
8-inch	+ 3½	....

Boiler Tubes

STEEL

1¾ and 2-inch	19½
2¼-inch	24
2½ to 3¼-inch	30½
3½ to 4½-inch	40½

IRON

1¾-inch	+10
2-inch	List
2¼-inch	2
2½ and 2¾-inch	6
3 and 3¼-inch	7
3½ to 4½-inch	12

LINK-BELT

Chains-Wheels-Buckets

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Boston 9	49 Federal St.	Cleveland	420 Kirby Bldg.	Los Angeles	163 N. Los Angeles St.
Pittsburgh	1501 Park Bldg.	Detroit	6216 Woodward Ave.	Denver	Lindsley, Shubert & Co., Boston Bldg.
St. Louis	Central National Bank Bldg.	Kansas City, Mo.	906 Elmhurst Bldg.	Louisville, Ky.	Frederick Wehle, Starks Bldg.
Buffalo	547 Ellicott Square	Seattle	8220 First Ave., S.	New Orleans	C. O. Hine, 94 Carondelet Bldg.
Wilkes-Barre	2d National Bank Bldg.	Portland, Ore.	First and Stark Sts.	New Orleans	Whitney Supply Co., Ltd., 418 S. Peters St.
Birmingham, Ala.	S. L. Morrow, 720 Brown-Marx Bldg.	In Canada		Canadian Link-Belt Co., Ltd., Toronto and Montreal	

New Trade Publications

STARTING SWITCH—A folder in which a safety starting switch for alternating current motor of the squirrel cage type is described and illustrated, recently was published by the Cutler-Hammer Mfg. Co., Milwaukee.

DRILLING MACHINES—The Frontier Machine Tool Co., Inc., Buffalo, has published an illustrated booklet in which several types of drilling machines are described and illustrated. Full details are given including specifications, etc.

REFRIGERATING SYSTEM—The National Tube Co., Pittsburgh, is circulating a descriptive bulletin, which is issued from time to time, each issue containing a description of a use to which pipe is put. The current issue is devoted to a description of the use of pipe in refrigerating systems, and is interesting and instructive.

PNEUMATIC CONVEYING—The Dust Recovering & Conveying Co., Cleveland, has published a 4-page illustrated folder in which four diagrams are presented and four typical pneumatic conveying installations outlined, pointing out the advantages and limitations of each. The descriptions and information given in the folder is extremely interesting.

HOISTS—The Euclid Crane & Hoist Co., Euclid, Cleveland, is circulating a 48-page illustrated booklet in which electric hoists, electric monorail trolleys, electric traveling cranes and electric wall and jib cranes are described and illustrated. Specifications, etc., are given, and the illustrations show actual installations of the various equipment.

FILTER—The Griscom-Russell Co., New York, has published an 8-page illustrated circular in which a multiscreen filter is described and illustrated. The shell of the filter is of cast iron. The area of the filtering surface is 250 times the area of the water inlet passage. The filtering elements are interchangeable. Complete data are given.

CHUCKS—A booklet entitled "Chucks and Their Uses," has been published by the Skinner Chuck Co., New Britain, Conn. It was compiled to afford helpful information, without duplicating the detailed technical descriptions contained in the company's catalog. It traces the history and development of the chuck and comprehensively covers its various applications. Suggestions and instructions are also given for the use and operation of the chuck. The booklet is illustrated.

CHARGING MACHINES — Horizontal charging machines are described and illustrated in a 36-page illustrated booklet recently published by the Morgan Engineering Co., Alliance, O. The bulletin calls attention to the prominent features of the equipment and shows the variety of chargers which the company can furnish. These chargers are manufactured for all capacities, for any required span and for either direct or alternating current. A general description is given. The illustrations include a number of actual installations.

CONTROL DEVICE—What is said to be a new departure in combustion control devices is described and illustrated in a bulletin recently issued by the Mono Corp. of America, New York. According to the folder this device is unique in that it automatically analyzes and records the combined percentages of three combustible gases during all such times as any or all of them appear in the flue, while it also produces a continuous accurate record of the percentage of CO_2. Both records are on the same chart. Complete details are given.

ELECTRICAL EQUIPMENT—The General Electric Co., Schenectady, N. Y., is circulating a 16-page illustrated booklet in which electrical equipments for movable highway and railway bridges are described and illustrated. In operations of this kind, both alternating and direct current equipments are used. According to the booklet, the electrical equipment for the different types of bridges is much the same. In the booklet, the details of the equipment described include the main operating motors, solenoid brakes, emergency brakes, controllers, resistors, lock motor, limit switches, etc. The bulletin also briefly describes the various types of bridges, such as swing span, draw, vertical lift and bascule bridges. Each type of bridge is illustrated.

GAS PRODUCER—The George J. Hagan Co., Pittsburgh, is circulating a 20-page illustrated bulletin in which a hand stoked gas producer is described and illustrated. According to the booklet this equipment is particularly designed for the economical and efficient production of bituminous producer gas. It consists of a cylindrical steel shell, reinforced with steel angles and with heavy steel plates on the bottom, and double riveted along vertical and horizontal seams. This shell encloses a double brick lining. The fuel bed rests partly on the grate, which consists of two perforated sloping surfaces, forming a ridge in the center of the producer. Other parts of the producer are described in detail and the illustrations include a number of line drawings.

STATIC CONDENSERS—A stationary or static type of condenser is described and illustrated in a bulletin recently published by the General Electric Co., Schenectady, N. Y. This type of condenser was developed to overcome the detrimental effect of a low power-factor for comparatively small loads. It may be installed in an out of the way space, and it does not require regular attendance. These condensers have been standardized for installation on circuits ranging in frequency from 40 to 125 cycles, in voltage from 220 to 2300 volts and in capacities from 30 to 300 kilovolt amperes, the smaller sizes being 30 and 60 kilovolt amperes, and then increasing in steps of 60 kilovolt amperes, each to 300 kilovolt amperes. For the correction of power-factor on circuits exceeding 2300 volts, transforming apparatus consisting of either a transformer or auto transformer is furnished to step the voltage down to 2300 volts. A number of curve charts, diagrams of connections, drawings and tables on prices, dimensions, losses and weights, etc., are given. The bulletin is well illustrated and contains a number of photographs of actual installations.

Business Changes Recently Announced

J GOEBEL & Co., 67 Cortlandt street, New York, have been appointed sales agents in the New York and New Jersey territory for the line of black lead crucibles manufactured by the Naugatuck Valley Crucible Co., Shelton, Conn. J. K. Moses, for almost 25 years crucible salesman with the Joseph Dixon Crucible Co., has severed his connection to join J. Goebel & Co., and he will handle the crucible sales of the latter interest in those two states.

* * *

Dill-Crossett, Inc., with offices at 235 Pine street, San Francisco, has announced it has changed its name to Dill-Coppage, Inc., N. M. Crossett having retired from the business.

* * *

Branch offices have been opened in the Central building, Los Angeles, by the Steel Mill & Foundry Supply Co., whose main office is in the Cunard building, San Francisco. W. A. Letcher has been placed in temporary charge of the new offices.

* * *

On March 21 the Connellsville Foundry, Machine & Steel Casting Co., Connellsville, Pa., moved its Pittsburgh sales office from 404 House building to 1212 Park building, that city.

* * *

Ditty Bros., Inc., 140 Howard street, San Francisco, have opened a warehouse and office at 2931 Santa Fe avenue, Los Angeles, and will carry a complete stock of foundry equipment.

* * *

Philip T. King, formerly with the Bedford Foundry & Machine Co., Bedford, Ind., and the Ohio Locomotive Crane Co., Bucyrus, O., has established permanent offices at 626 Hudson Terminal building, 30 Church street, New York. He will deal in cranes and contractors' supplies.